DOCUMENT RESUME

ED 165 096 CS 004 570

AUTHOR	Rawson, Margaret B., Ed.
TITLE	An Interdisciplinary Journal of Specific Language Disability. Volume 27.
INSTITUTION	Orton Society, Towson, Md.
PUB DATE	77
NOTE	255p.; May be marginally legible due to small print
AVAILABLE FROM	The Orton Society, Inc., 8415 Bellona Lane, Towson, Maryland 21204 ($6.00 plus $0.60 postage and handling; reprints: 1-10 pages, $0.60; 11-15 pages, $0.75; 16-20 pages, $1.00)
JOURNAL CIT	Bulletin of the Orton Society; v27 1977
EDRS PRICE	MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS	Cerebral Dominance; *Dyslexia; Educational Therapy; Elementary Secondary Education; Foreign Countries; Information Processing; Language Development; *Language Handicaps; Language Proficiency; Lateral Dominance; *Learning Disabilities; Minority Group Children; Neurologically Handicapped; Postsecondary Education; Reading Difficulty; Underachievers

ABSTRACT

This bulletin is produced annually in the interest of children with specific language disability, learning disabilities, or dyslexia. The 16 articles in this issue deal with the following topics: specific learning disabilities; lateralized tachistoscopic recognition, cerebral dominance, and dyslexia; language proficiency and lateral position in the classroom; assessment of language development; dyslexia as a limitation in the ability to process information; the Orton-Gillingham methodology; interactions between educational therapist and child; reading problems worldwide; learning disabilities in German children; dyslexia in English independent systems; learning disabilities in minority adolescents; teaching "the language as it is"; structural arithmetic and children with learning disabilities; Project Succeed (a tutorial program in Baltimore); the shadow and substance of specific language disability; and dyslexics as adults. (FL)

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BULLETIN OF THE ORTON SOCIETY

AN INTERDISCIPLINARY JOURNAL OF SPECIFIC LANGUAGE DISABILITY

ED165096

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XXVII 1977

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BULLETIN OF THE ORTON SOCIETY

Volume XXVII, 1977

Editor: Margaret B. Rawson *Associate Editor:* Jan paul Miller
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Foreword

This twenty-seventh issue of the *Bulletin of the Orton Society* contains papers from the twenty-seventh annual meeting of the Society held in November, 1976, in New York City as well as others not presented at the conference. The editors have attempted to present a representative cross-section of the conference proceedings as well as other papers of interest to the readers of the Bulletin.

The views presented throughout the volume are those of the writers, for The Orton Society holds neither an official view nor judgmental responsibility. The editors have attempted to include materials that seem relevant to the Society's stated purpose: "the study, treatment, and prevention of problems of specific language disability."

An index to the titles and authors of the contents of the first twenty-seven volumes of the Bulletin is available, as well as a brochure stating the Society's purpose, conditions for membership, and a listing of its current publications. Interested persons should write the Society's central office for information.

The editors welcome our readers' comments and criticisms. Papers and other contributions to be considered for publication in Volume XXVIII should be submitted as long as possible before January 1, 1978, in duplicate and in conformance with the Instructions to Contributors which is available from the Society's central office.

Margaret Byrd Rawson
Editor

Contents

Foreword v

The Samuel T. Orton Award for 1976 to Roger E. Saunders 1

Specific Learning Disabilities
Zdenek Matějček, Ph.D. 7

Lateralized Tachistoscopic Recognition, Cerebral Dominance, and Dyslexia
Walter F. McKeever 26

Language Proficiency and Lateral Position in the Classroom
Dirk J. Bakker, Ph.D. and *Raymond Van Rijnsoever, Ph.D.* 37

Tests for Assessment of Language Development
Abraham Gerson Epstein 54

Dyslexia as a Limitation in the Ability to Process Information
N. C. Miles and *T. R. Miles* 72

Orton-Gillingham Methodology: Where Have All of the Researchers Gone?
Carl L. Kline, M.D., C. R.C.P.(C) 82

Interactions between Educational Therapist and Child
Katrina de Hirsch, F.C.S.T. 88

Reading Problems Worldwide
Muriel Tarnopol 102

Learning Disabilities in German Children
Edith Klasen, Ph.D. 112

Dyslexia in English Independent Systems
Marion Welchman 127

Learning Disabilities in Minority Adolescents
Lester Tarnopol, Sc.D; J. Scott Breed, M.A.; Muriel Tarnopol, M.A.; and Michael Ozaki, B.A. 132

Teaching "The Language as It Is"
Elsie D. Smelt 149

Structural Arithmetic and Children with Learning Disabilities
Margaret B. Stern 171

Project Succeed: A Volunteer System in Action
Tucky P. Heller, M. Ed. 183

The Shadow and Substance of Specific Language Disability
Jane McClelland 187

Dyslexics as Adults: The Possibilities and the Challenge
Margaret B. Rawson 193

June Lyday Orton, 1898–1977 198

Reviews 204

5

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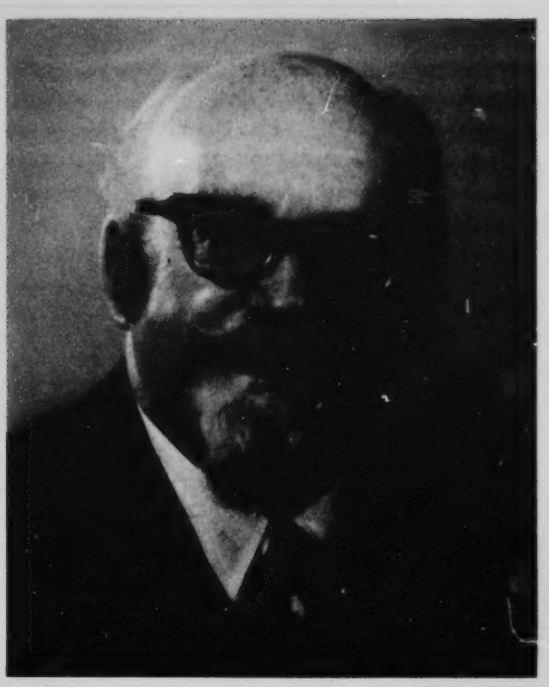

The Samuel T. Orton Award for 1976

Presented by The Orton Society to

Roger E. Saunders.

Presentation by Betty Wells

There are members more deserving of this privilege, but none more delighted than I to have been asked to present the Samuel T. Orton Award to Roger Saunders.

It is fitting that Roger receive this award in New York. It was here, at the Princeton Club, nine years ago that he accepted the presidency of The Orton

Society with its membership count—so dear to dyslexics—of 303. It has been with deep affection that many of you from that 1967 charmed circle have offered your memories for sharing with the 4,297 of us who joined The Orton Society under Roger's reign.

If as has been said, "The child is father to the man," Roger's two and one-half dollar GOLD COIN, awarded to him at age six in rural North Carolina for being "The Best All-'round Boy in School," was prophetic. For a similar superlative was to be his award as a graduate from Pfeiffer Junior College.

After junior college, his education was interrupted but furthered by Government "Greetings" which brought him to the Air Force and the rank of Sergeant Major in a regional hospital. Back in college in Louisiana, he balanced his psychology major with student activities which led to his being chosen as "Best All-'round Senior Man" and selected by the faculty for citation in "Who's Who in American Colleges and Universities."

Exploring the field of clinical psychology, Roger spent a year at the Institute of Living in Hartford, Connecticut, before receiving his degree in psychology from Southern Methodist University in Dallas, Texas. This prepared him for an internship in clinical psychology at the Bowman-Gray School of Medicine of Wake Forest University, Winston-Salem, North Carolina. Here he came to know and appreciate Mrs. June L. Orton, Dr. Lloyd J. Thompson, and Dr. Richard Masland.

Stimulated there by a visiting lecturer, Helene Durbrow, Roger requested a summer's leave of absence to be a counselor in her camp for children with specific language disabilities in Underhill, Vermont. There he worked with dyslexic teen-agers and this experience strengthened his desire to learn further not only how to diagnose, but also how to teach children with this learning problem. He became an advocate for the whole child, and these goals were enhanced back in North Carolina by June Orton.

He moved to Baltimore, Maryland as clinical psychologist to the Board of Education, became active in local professional organizations and in The Orton Society. The lectures at the annual Orton meetings in New York gave insights and strength, and Roger began intensive participation in the work of the Society.

As President of The Orton Society, Roger devoted almost a third of his time to its programs and its management. During his terms of office he joined the graduate faculty of Loyola College as a full time associate professor, was senior author of LINCS and developed programs in public and private schools

in Maryland and other states. But no matter which project had priority, he was always available for consultation and concerned with the problems of others.

This concern for others is the genius of Roger. His legacy to us is not programs dedicated in his name, but people dedicated to his goals.

And now is the time for The Orton Society, with this citation, to honor Roger Saunders . . . Psychologist, Counselor, Teacher and Friend—

- For his recognition of and credit given to the Society's pioneers who built slowly and solidly the goodly heritage that is ours;
- For his ability to nurture raw zeal into talent by supplying the necessary knowledge, the excellent example and warm support for novices;
- For his calming influence on parents whose fears block their perceptions;
- For his devotion to and compassion for those who are the Society's reason for being . . . the children and young adults with Specific Language Disabilities . . . and for his gift to them of faith and the courage to go on,

THE SAMUEL TORREY ORTON AWARD for 1976
is presented to ROGER EARL SAUNDERS.

Response
by Roger E. Saunders

Thank you, Mrs. Wells. It is indeed both an humbling and an exalting experience to be honored by The Orton Society, and particularly to have this Award presented through such a distinguished volunteer and professional worker as yourself.

When one receives such an honor as this, there are many persons to whom appreciation should be expressed: first, to one's *parents*, who contributed from their genetic pool and nurtured the product in an environment of love, understanding, and direction; next, to *teachers*, whose patience and challenge lent the positiveness and courage to fulfill academic aspirations; to

clients, whose trust enhances a sense of professional responsibility and a desire to learn more; to *students*, who always teach their teacher by constantly challenging his concepts; and, finally, to *professional colleagues* whose freely-shared knowledge and insights contribute immeasurably to one's continued growth, especially through our association in The Orton Society.

For my life, and for the Society, all of the above are true partners, and more. Each of you has given freely of your time, energy and inspiration to this volunteer organization, and your devotion has been the real reason it has grown to international influence. Indeed, it is not the Society, but rather you as individuals working effectively with individuals and sharing your ideas about their nature and needs which has made the organization strong. Each of you truly shares in the Samuel T. Orton Award.

As I reminisce about the early years of my involvement in this Society there comes to mind first one very special person with whom I would always check the validity of a new idea. It was Robert Hall, in particular, who gave me the personal courage to forge ahead, for in those days when we had no money in the treasury to back up new ventures. He would always say, "Try it, Roger, and if it doesn't work, I will pick up the tab." Fortunately, he never had to, but it was good to have an "angel" in reserve!

All of the former presidents of the Society are here tonight. Thanks go to them from all of us, for without their leadership the Society would have foundered. Now that it is rounding out its 26th year, we can borrow a quotation from Proverbs and admit to its early leaders that we know that we ". . . reap where (we) have not sown"! Their harvest is growing riper, and it is for us to be loyal laborers in the field. In the 1920's there was a small group of teachers and other professionals who said, "Some children learn differently." Their challenge was to learn how and why this was so, and to develop educational strategies for teaching them appropriately. Observations similar to theirs were being made in England, Denmark, Czechoslovakia, and other countries. Our present worldwide interest and development of new knowledge about persons with dyslexia is enjoying a strong spotlight; this would not have been possible without the work of the early pioneers. We in 1976 are enjoying their harvest and we are grateful.

The first president of the Orton Society was June Orton. Her favorite expression is, "The past is prologue to the future." With the help of a small group of persons, she established the Society on a firmly-organized foundation. She continued to remind us of Dr. Orton's warm personal qualities, his modesty, and his scientific accuracy when he said, "No two dyslexics are ever alike," ". . . this is a condition, not a disease," ". . . we are dealing with the

total language function, not just poor reading," and ". . . the diagnosis is clinical; the treatment is educational."

Sally Childs was our second president. She had been the inspired student of Anna Gillingham. Sally continues to remind us to "teach through the intellect," to be aware of the high level of reasoning which most dyslexics seem to have, and to teach them to "think and do," for *both* are important.

Margaret Rawson was the next president. She will be remembered for her scholarly writing and willingness to give unreservedly. She gave us the all-encompassing theme, "Teach the language as it is to the child as he is," which has been the motto of many conferences. It is she who bears in upon us that, "Diagnosis without treatment is cruelty," and reminds us late-comers that, "If we see further, it is because we stand on the shoulders of giants."

And now, Dale Bryant is capping his term as fifth president by leading us through this most excellent International Conference.

Reminiscing further, when Dr. Lloyd Thompson received the Samuel T. Orton Award in 1970, he used the opportunity to challenge his audience with what he called "an old chestnut." During the 50's and 60's the term "brain damage" had become popular. Dr. Thompson, harking back to the original hypothesis of Dr. Orton, restated from his experience in the 30's and 40's that we are not dealing with brain *damage*, but rather with a variation of *developmental delay*.

Following Dr. Thompson's lead, my primary thought tonight is to remind us that whatever else dyslexia is, it is a problem with the *memory*. How does one make memory work, whether for *input*, *storage*, or *retrieval*? The memory must be serviceable, stable, reliable, and appropriate. Perhaps I am overly sensitive to this, for it is one of the obvious and most puzzling symptoms known to the dyslexic person. I think perhaps Lucy (from the comic strip "Peanuts") was right, for when Charlie Brown complained about his poor memory, she retorted, "Maybe you don't have such a bad rememberer. You've just got a very good forgetter." Life is like that for the dyslexic—a struggle to keep fresh a consistently reliable "rememberer," all the while combatting the forces of the "good forgetter." Emotional devastation can follow this lack of recall, for "I've forgotten" is more damaging to the child's feelings about himself than, "Gee, I never knew that." The idea of instability of memory is not a new concept in learning theory, but refreshing our thoughts about it may give new insights into the human, emotional, interpersonal relationships which are easily destroyed by the return of old anxieties from early classroom failure.

Again let us thank June Orton for making "The past is prologue to the

future" come true, Sally Childs for "Keep the intellect at work while you teach," Margaret Rawson for reminding us of our distinct heritage and commitment to treat children as unique human individuals, and Dale Bryant for his arduous efforts in helping to bring us together on this occasion of fellowship and re-dedication. Most especially, *I* thank *you* for the personal inspiration you give me by your attendance here tonight as you present me with this most appreciated honor.

Specific Learning Disabilities

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A Little History

It seems likely that specific learning disabilities (SLD*) have existed as long as human learning itself. They were discovered, however, only at the turn of the last century, and only since the fifties have they become a pressing social problem in the developed countries of the world.

The ideal of education really available to all, which was expressed with such urgency by Comenius in the 17th century, has in fact, been realized only in this century, and only in some countries; for there exist countries where mandatory school attendance has not yet been introduced. On the one hand, this represents an immense broadening of the educational foundation and a great upsurge of creative forces. On the other hand, of necessity the demands and educational "pressures" upon children have increased. For society the education of each individual represents an important economic asset, for the family the highest social prestige, and for the child himself the most reliable prerequisite for satisfactory vocational and social integration. In the developed countries in recent decades it has clearly been shown that relatively small deviations in the mental development of a child, which earlier had been considered as negligible and had escaped attention, are now becoming pressing and threatening. If at present specific learning disabilities are called the "disease of the century" (Mucchielli, 1963), it is not because such disabilities have only now occurred, or that they are becoming epidemic, but that with generally higher demands made upon education, they are becoming more important and more conspicuous.

John McLeod, in 1972, pointed out that "Special educational provisions were made first for the blind and deaf, the physically handicapped and the

*Specific language and/or learning disabilities, or SLD and dyslexia, as defined below, are used synonymously in this paper.

severely mentally retarded; then for the mildly mentally retarded, and latterly for those with less readily visible handicaps such as emotional maladjustment, cerebral palsy and perhaps the most subtle educational handicap of all—dyslexia, language, or learning disability."

Because there are numerous indicators that the advance of civilization is accelerating, one must assume that the educational pressure upon future generations will probably be even greater and will concern broader and broader strata of the earth's population. Thus more and more will depend upon the maximum development and utilization of the whole spiritual potential of man. To help children to avoid a breakdown in the educational process means protecting them from difficult life situations in which they become mentally "broken or maimed." It also means saving for society those incalculable assets represented by the healthy personality development of each of its members.

This European and North American development, with a certain acceleration, is being repeated in the developing countries. However, if a country has not yet introduced mandatory school attendance, the problem of language learning disability will not yet have been practically noted. At present, however, this is to an increasing extent the exception. Wherever the need for education is felt, the problem of language disability arises—and the time is not far off when preventive and corrective measures in this field will be as much in demand in the educationally emerging lands as is the case today in the so-called developed countries.

Thus learning disabilities are truly becoming a world-wide and highly pressing problem.

Terminology and Definition

Even in countries where the problem of specific learning disabilities has been known for some time and where organized care of afflicted children has some tradition, a number of confusions exist in connection with these disabilities. This is also manifest in a lack of unified terminology. The Tarnopols (1976) mention 40 various names which are entirely or to a great extent synonymous.

On the one hand those who do practical work with SLD children, either diagnostically or therapeutically, have no doubts about the existence and specific nature of the disability. On the other hand those working in the field of theory and research have not yet been successful in providing a satisfactory

definition of this specificity. Since, however, we cannot do without some definition, let us quote one as an example—the definition published by the US Office of Education (1970).

According to it, a specific learning disability refers to children who have

> a disorder in one or more of the psychological processes involved in understanding or using language, spoken or written, which disorder may manifest itself in imperfect ability to listen, think, speak, read, write, spell or do mathematical calculations. Such disorders include such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia and developmental aphasia. Such a term does not include children who have learning problems which are primarily the result of visual, hearing or motor handicaps, of mental retardation or emotional disturbances, or of environmental disadvantages.

I consider it useful, in view of the existing Babel-like confusion, to distinguish the behavioral and psychological level from the etiological level. The former category includes such terms as "reading disability," "dyslexia," "Lese-Rechtschreibschwäche," "perceptual handicaps," etc., while the latter includes those related to the brain and its functions, such as "brain damage," "minimal brain dysfunction," "genetic dyslexia," etc.

It is also quite necessary to distinguish between, on the one hand, a general "backwardness" in learning which is usually connected with lower intellectual capacity or with unfavorable sociocultural conditions and, on the other hand, "specific retardation," based on specific mechanisms within the organism of the child.

In this context let us quote M. Rutter and W. V. Yule (1975):

> Specific reading retardation constitutes more than just the lower end of the normal distribution in that the frequency exceeds that predicted on statistical grounds. The disorder differs from reading backwardness in terms of sex distribution, neurological disorder and patterns of neurodevelopmental deficit, demonstrating the clinical validity of the distinction.

Also the US Office of Education distinguishes specific learning disability (see definition above) and "general learning disability," which is similarly defined, except that it refers to children who are mentally retarded.

The term "specific learning disability" is, as we have seen, rather broad.

It includes specific retardation in the whole academic process. Most frequently found and socially the most significant are specific disabilities concerning higher forms of communication process—reading and spelling—since these represent the path to education in general. Reading and spelling disabilities were also the first to be discovered, have been most thoroughly studied, and relatively we know most about them. In the USA for instance there are more than 20,000 publications on reading problems alone; in Germany there are more than a thousand (E. Klasen 1976). There seem to be relatively very few specific mathematical disabilities, at least as described in the literature.

Thus in this paper we will often use specific reading or language disabilities as models or examples for specific learning disabilities—with the stipulation that they are of course not identical with the whole term of SLD.

Etiology

The example of dyslexia can immediately be used to clarify somewhat, in general terms, the essence of SLD.

The World Federation of Neurology defined specific developmental dyslexia in 1968 in the following manner: "A disorder manifested by difficulty in learning to read, despite conventional instruction, adequate intelligence and sociocultural opportunity. It is dependent upon fundamental cognitive disabilities, which frequently are of constitutional origin."

M. Rutter and W. V. Yule (1975) raise the objection that such a definition in fact excludes the incidence of dyslexia among the mentally retarded, culturally deprived, or otherwise handicapped children. This objection provides, it seems to me, the key to the conceptual difficulties with any specific learning disability.

The definition might be improved upon by saying the disability is not caused "only" or "primarily" by an intellectual deficit, by sensory impairments, motor handicaps or external socio-economic factors, but this certainly would not be enough. Theoretically speaking, any child whose level of intelligence is such that he is capable of a school education (which includes many who are mentally retarded, culturally deprived, with sight and hearing impairments of such an extent as to still make reading possible, etc.) could be afflicted by dyslexia. However, these factors are of an aggravating or background or concurrent nature. The causes themselves are specific and not yet entirely clear. It is for this reason that the disability is often designated as "strange" and lacks credibility among some theoretical psychologists and

educators. The disability seems to be primarily in the organism of the child—in this sense it is "internal." External conditions form a more or less suitable environment for its pathogenesis. (This does not, of course, preclude that negative external conditions may lead to a generalized retardation in learning and, in the final consequence, to illiteracy. This, however, concerns a different, world-wide social problem.)

Let us come back to reading and spelling. One can hardly assume that there exists a single, uniform capacity for learning to read. Doubtless a combination of a number of functions must exist. Under normal conditions they are arranged in certain patterns ("complex" capacities of various sorts), which then become the internal psychological foundation for acquiring certain skills—in our case reading and spelling. Under unfavorable "internal" conditions this fundamental pattern of congenital dispositions may be organized in a less suitable and efficient manner. This can occur by genetic mechanisms or by damage to the brain in an early stage of development.

The fundamental pattern of dispositions does not, however, automatically provide the capability for reading. Development and a certain functional maturity is necessary. We are not dealing with a static, one-dimensional pattern, but with a dynamic structure. It seems evident that certain individual functions can have different dynamics of development, that they mature at various speeds and as a consequence their mutual relationship does not necessarily have to be the same during each phase of development.

New research on lateralization of speech in the cerebral hemispheres, carried out on the dichotic listening tests, shows that individual brain structures, and thus also individual mental functions, have their individual rates of maturation. For achieving a certain skill (e.g. reading) a certain degree of complementary maturity and cooperation is necessary. This revives Orton's ideas concerning the importance of brain lateralization for learning to read and spell. At present we do not, however, look for the cause of the disability in the insufficient dominance of one hemisphere, but rather in the disturbed interaction between various functions which behave atypically as to their maturation and lateral fixation in the cerebral hemispheres.

One is tempted to speculate that man—as the youngest of the animal species—at the time he was already capable of developing civilization, was not yet functionally quite finished. Civilization caught up with man in some sense "prematurely," i.e. before his lateralization of functions was completed.

Thus the disability might already exist in the fundamental pattern of dispositions and capabilities—but it also might exist only in its developmental

13

dynamics. It seems only natural that a fundamentally disturbed pattern of dispositions will develop unevenly and irregularly and that some functions may not develop at all. Or the case might be that the fundamental pattern is more or less normal, but that the process of maturation and development of its individual elements is disturbed. This may again occur by genetic mechanisms or by brain damage (in the broadest sense of the term). But in this case it may occur also through neurotic and deprivational mechanisms. Some functions can, in their development, be "blocked" (in the case of a neurosis) or be chronically "understimulated" (in the case of psychological deprivation) so that they do not develop sufficiently. At the time the child needs to use them when he begins to learn to read and spell, they are still underdeveloped.

Practical experience seems to confirm these assumptions. The clinical picture of specific reading disabilities is variable. The incidence of dyslexia is somewhat different in countries with various structures of language, grammar, and teaching methods. It can be again assumed that in various language structures, when the child is taught to read, somewhat different elements of his mental equipment are placed under demand and stress. Also different demands upon his mental equipment are made if the phonic methods or whole word methods are used, etc. For the time being it is not clear if the percentage of dyslexic children differs specifically because one or the other method is used since a number of other factors are involved. But even if the percentages were the same, it seems likely that they would not be formed by the same children in both pedagogical cases.

If we accept the hypothesis that the most important etiological factors are genetic mechanisms (for which some research evidence has been provided) and the mechanisms ensuing from brain injury (for which there is just as much statistical, research-based, evidence, if not actually more), then one might expect that the incidence of more severe disabilities will not differ too greatly from one country to another and from one language system to another. Greater differences might be expected among milder cases. Such differences as easiness or difficulty of reading and spelling (which differ in English, German, Spanish, Czech, Japanese, Chinese, etc.) might be expected to play a role.

It is also natural that a mild case of disability will become apparent in a negative constellation of external conditions, whereas under favorable conditions it is more easily compensated for, or remains under the threshold of conspicuousness. It also seems likely that severe defects will have an impact

even when educational stress is at a minimum (see above), while with increasing pressure (when school becomes unpleasant, demanding, hard) the more "minimal" deviations become socially significant.

A great deal of discussion has been devoted to the question of the emotional causes of dyslexia and other specific learning disabilities. It can be considered as proven that in some cases (sporadic only) emotional factors are the primary factors which "block" the development of the necessary functions. Well-documented research, however, also has shown that the great majority of emotional disorders among learning-disabled children are of a secondary nature. They are the outcome of life situations in which an SLD child finds himself. Various sources are in agreement that about two thirds of the children suffering from SLD have serious, but usually secondary, emotional disturbances and problems. Hyperactivity, impulsive behavior, fears, aggressiveness, lack of self-confidence and feelings of inadequacy appear among those most often listed, i.e. manifestations which can be understood as a defense against anxiety.

Almost all more extensive publications on SLD include a chapter on the relationship between this disability and delinquency, which is also generally secondary and consequent upon the learning disability.

Besides this it should be taken into account that behavioral disorders and emotional problems do not necessarily *have* to be either the cause or the consequence of SLD. They may be only a parallel manifestation, i.e. they may have the same origin in perhaps minimal brain dysfunction or in the lack of maturation of the central nervous system caused by other factors, or may simply be concurrent.

In any case it may be concluded that all existing investigations in this field provide a simple warning: A child with SLD under conditions of contemporary civilization is, as a consequence of his disability, exposed to secondary personality complications, and commonly needs psychological counselling or psychiatric treatment. If he does not receive adequate and timely help, his personality development is threatened.

Differences between the Sexes

Studies from all parts of the world evidently agree that boys suffer much more frequently from SLD than girls. The ratio of 5:1 is most often mentioned.

Explanations are sought in genetic mechanisms (as yet in a none-too-

convincing manner). On the other hand there is much clinical and experimental evidence that males are more sensitive to biologically and psychologically noxious factors. Thus we can assume a greater incidence of SLD in boys because of their greater susceptibility to damage to the CNS (prenatal, perinatal, and postnatal) as well as the greater sensitivity of boys to aggravating social and emotional factors. When there is frank brain damage the proportions of the sexes are likely to be more nearly equal.

Incidence

From the preceding it follows that SLD can be of various intensities—mild, severe, extremely severe. One can assume that the incidence of more severe disabilities will be more or less constant. The incidence of mild disabilities seems to be more variable, i.e. more dependent upon a number of accidental factors, such as:

teaching methods;

aggravating factors—e.g. negative socio-cultural situation, a bilingual environment, insufficient motivation, poor health, etc.;

educational pressures—the greater the demands made by school, the greater the likelihood of manifestations of mild forms of the disability;

the level of diagnosis and treatment—the more the problem is the subject of general knowledge and the higher the level of diagnosis, the greater the likelihood that even mild cases will be discovered. The greater the availability of therapy and the more successful it is, the greater the number of parents and teachers who will demand treatment for their children, even in mild cases.

Probably a number of other such factors could be found. And it seems that these are the factors also responsible for the surprisingly varied incidences of SLD quoted for the child populations of various countries, ranging from 1 percent in China up to 33 percent in Venezuela.

When these data are critically analyzed one can, however, arrive at more optimistic conclusions. Leaving aside China and Japan with their specific manner of writing, we see that the percentages most often mentioned in well-documented studies do not exceed 10 percent. Interesting differences seem also to be the result of the extent that a given language is close to the ideal of phonetic spelling. In countries where spelling is phonetically consis-

tent, incidence ranges between 2–4 percent (Czechoslovakia, Spanish speaking countries, Finland, etc.), between 4–6 percent where German is spoken, and between 5–10 percent in English speaking countries. Wherever more than fifteen percent incidence is quoted it seems that poor school achievement due primarily to factors that lower IQ test scores and/or socio-cultural deprivation is included (e.g. South American countries), or that there are specific pedagogical reasons.

The higher numbers sometimes quoted for the U.S.A. (between 20–25 percent) seemed to be somewhat dramatized for drawing the attention of the public and the government to the problem and helping get financial support necessary for launching remedial programs. L. Tarnopol (1976) claims that at present only 1.9 percent of children in the U.S. make use of remedial programs and that possibilities exist for only 3.1 percent children now, whereas the need is approximately 10 percent of the child population.

However, it is sufficient to compare the incidence of SLD with the incidence of chronic somatic diseases, to immediately see the social significance of the problem. Furthermore, if we realistically assume that at least two thirds of all children with SLD have more or less severe emotional problems and that they are threatened in their further development, it becomes apparent that it is no longer possible to overlook this problem or remain silent about it.

Diagnosis

We have already mentioned that SLD does not have a uniform etiology and that the intensity of symptoms is determined by a coincidence of mutually interrelated causal and aggravating factors. From this it follows that diagnostic techniques cannot stem from any single field of scientific inquiry. One might go so far as to say that SLD can serve as an excellent model of an interdisciplinary problem requiring an interdisciplinary approach. In fact, diagnostic and therapeutic procedures were elaborated only when the principles of interdisciplinary team work began to be implemented.

If, however, diagnosis is a problem to be dealt with only by a team of specialists, this in itself makes great organizational demands. Such cooperation requires the necessary organizational foundation, which in turn assumes that individual fields of inquiry exist in a given country, that they are sufficiently developed, and that the relevant specialists can be made available.

Social workers, psychologists, pediatricians, neurologists, child psychiatrists and other medical specialists are required for diagnostic work, as well as

special educators, speech therapists, and others. A review of the situation existing in various countries indicates that this team work is usually provided only by some top institutions and that diagnosis is all too frequently the work of individuals. Such a situation, in turn, leads to the lack of unity in terminology, in the criteria of assessment, in diagnostic procedures, etc., which are so frequently deplored.

A diagnosis of SLD is, generally speaking, based upon a discrepancy between the intelligence of a child (assessed by psychological intelligence tests) and his school performance—under the assumption that the socio-cultural, health, motivational, emotional, and other conditions for his school education are normal, standard, not disturbed, or at least such that in themselves they cannot explain the breakdown in the child's school performance. It is necessary always to examine and assess all three of these areas—the academic performance of the child, the child's intelligence and the conditions for his education.

The first step in diagnosis is a detailed case history. Testing is usually the next step. Wherever diagnostic work is done, some kind of battery of psychological tests is used. Psychological intelligence tests are a necessity, as are standard achievement tests of reading, spelling, and arithmetic. All these tests, however, must be standardized for each country and culture and for each child population. They cannot be transferred from one language and cultural region to another.

Tests also are given which attempt to determine the level of those functions which are necessary for learning individual school subjects. A very long list of tests might be cited which are used, such as sight and hearing perception tests, drawing tests, motor tests, tests of laterality, right-left orientation, and recently dichotic listening tests.

The Tarnopols (1976) say: "Another important generalization is that, based on many studies, over 90 percent of children with SLD show evidence of visual-motor or motor discoordination."

Next there are tests designed to show the emotional and social situation of the child, tests of family relations, sociometric measurements, etc.

Thus we see that competent diagnosis is rather time-consuming—another demanding aspect of SLD!

An important task of diagnosis is connected with prevention, i.e. the question of the earliest possible discovery of the disability. The ideal would be to discern the threat before the child enters school and becomes neurotically affected by embarassing experiences of "undeserved" lack of success.

Work in this direction has only recently begun, nevertheless attempts seem to be very promising (Jansky, de Hirsch 1972; Slingerland 1972; Silver and Hagin 1967). The prediction validity of existing test batteries is already sufficient, so that they are being gradually introduced in many countries.

Moreover a special remedial or preventive program which is dependent on such diagnostic procedures cannot harm a child who might be diagnosed incorrectly and thus erroneously included in the SLD group. It is better to pinpoint as many potential cases of SLD as possible, even at the cost of including some children who do not have the disability, rather than to have children suffering from SLD remain without therapy. In other words, it is not necessary to wait for an entirely perfect tool; it is possible to help children here and now.

Remedial Treatment

Remedial treatment of SLD should always be based upon a diagnostic analysis of the case. It can best be designated as an ongoing diagnostic-therapeutic experiment, since the success or lack of success of individual remedial methods is the only final proof that the preceding diagnostic conclusions have been correct.

The diagnosis is an interdisciplinary problem, and this is also the case with therapy. Various specialists have to contribute on various levels: remedial teachers, psychologists, neurologists, psychiatrists, speech therapists, etc. This again assumes that all these specialists are available and that an organizational basis exists which can bring them all together. As indicated above, such complex team work in therapy of SLD is more the exception than the rule and all too often individual therapists attempt to carry out treatment. Also, idle arguments among various specializations concerning who should deal with SLD therapy regrettably are not yet quite a thing of the past.

If the etiology of the disability is variable and differs from individual to individual, remedial procedures and approaches must be adapted to this fact. The corrective repertoire should be sufficiently extensive to provide choice. And the persons making this choice should truly understand the individuality of the child, as indicated by such statements as, "The starting point is the child, not the method," (R. Syvälahti 1976); "Adapt the educational program to each child's or group of children's abilities rather than relying on the program prepared beforehand," (M. Jansen et al. 1976); and "While the

discussion several years ago concentrated on what specific method was to be recommended for beginning reading instruction, there seems to be a shift today towards utilizing assets gained from a variety of methods," (G. H. Vik 1976).

Final consequences of SLD are of a social nature. It is society which suffers if considerable economic losses occur through SLD children's school underachievement. Parents for whom a successful school career of their children represents the highest satisfaction suffer in their turn. And of course the child himself suffers both from the experience of being unsuccessful and from a limited outlook for the future. Thus all three elements must be committed to the success of remedial measures. This concerns first the state and its social institutions. Insofar as they do not exist it is necessary to form them. If they do exist, it is necessary to concentrate attention upon the proper task and force the pertinent professions to cooperate, which is often not a simple task.

Also parents and all those who have a potentially positive emotional relationship towards the child have to be committed to the child's therapy. They represent an important supporting factor and very often they can undertake numerous remedial measures themselves, preferably under expert guidance.

And finally the child himself must be committed to the implementation of corrective measures.

Here it is necessary to "base the work on the pupil's strengths and compensate for weaknesses by strengthening his strong areas," (M. Jansen et al. 1976).

It is necessary to strive for a special teacher "who masters the technique and insight involved in utilizing and developing the child's strengths as well as strengthening his weak areas," (G. H. Vik, 1976).

The choice of methods is of course dependent upon the structure and spelling of the language as well as on the clinical picture of the defect and finally upon the time the remedial teacher is available. Up to now no single satisfactory method has been found which would be suitable for all children with SLD or even for the same child during various stages of remedial treatment.* Each method must be more or less modified for each child. Here the remedial teacher becomes a specialized therapist. This is indeed a lofty calling which is likewise very demanding and requires a high degree of

*The Orton Society, in the U.S.A., puts it: "We should teach his language as *it* is to each child as *he* is."—Ed.

special preparation. Moreover this leads to great demands on organizational systems. Remedial programs for SLD children are much more complex than normal curriculums.

> G. H. Vik, 1976: It should be kept in mind that special education is something more and different from placing a child in special school, class, or clinic and providing him with programmed instructional materials, splitting a regular class into halves, introducing a teacher assistant, or utilizing a team-teaching approach. All of these organizational patterns and instructional solutions are found in the elementary school special and regular programs. Special education occurs when the instruction is based on a differential diagnosis of the child's specific abilities and disabilities.

The use of psychotherapy in remedial programs represents a special question. Some workers give psychotherapy a prominent place, some even a decisive one, claiming the necessity to deal with the secondary emotional problems of the child first and to correct his disturbed motivation. Others, however, consider psychotherapy as redundant and do not include it in the corrective program at all. They claim that the best psychotherapy is the success of the child in the remedial program, i.e. the child finding that through his own endeavors he is able to overcome his disability. There are as yet no objective studies which would confirm one or the other stand.* Of course, if we take into account the great variability of SLD we cannot reject either approach; both seem legitimate and everything will depend on their method of implementation rather than on the manner in which they are postulated.

The organization of remedial treatment in various countries provides again a very wide range of solutions. A great deal, of course, depends upon the organization of the school, public health and social welfare systems and this differs to a great extent from country to country. Nevertheless in spite of this diversity we can find some unifying criteria. There can be distinguished approximately four different levels at which remedial treatment is carried out:

1. The teacher in an ordinary school, in a normal class and within the framework of the normal academic process, carries out remedial

*See Kline's article in this issue.—Ed.

measures with the least severe cases. According to individual needs of the child the teacher may add certain remedial therapy elements.

2(a). The child stays in an ordinary school and in a normal class, but within the selective part of the curriculum he takes up remedial learning. This is usually undertaken by a specially trained teacher who should be aided by other experts and who works either with a small group of children or with single, individual children.

2(b). The child attends a regular school. Remedial therapy is carried out outside the school, most often in specialized centers which the child visits several times a week.

2(c). The child continues to attend regular school. In a specialized center, where the diagnostic work was done, both the child and his parents receive introduction to remedial treatment and basic training in remedial methods. The remedial treatment is then carried out by the parents under the guidance of experts who check up on its course once every 2–3 weeks.

The experience in countries where this method is used show that approximately 50 to 60 percent of parents are quite capable of carrying out remedial work with their children, if they are constantly being instructed and led. This method is advantageous not only economically but also because of the psychological bonuses which it brings, e.g. it provides parents with an opportunity to compensate for their feelings of guilt towards the child by successful remedial activity, etc.

3. The child attends a special school (such as those which exist, for instance, in the Netherlands) or special classes with special teaching programs and with a limited number of pupils. Most frequently the maximum number of children in the class is 15 (in Czechoslovakia 12, in Denmark 9).

4. The child attends a special in-patient institution. This is feasible especially in those countries where the child's staying in a health care institution is free of charge.*

In Czechoslovakia such specialized departments exist within child psychiatric wards. They are reserved for the most severe cases which can then receive concentrated aid by a whole team of specialists.

All these types of care, of course, assume a well-functioning school and health care system and adequate mutual cooperation. The former is more or less a matter of course in the developed countries, but surprisingly this is not

*Independent special schools exist, notably in USA, for this group of children. Expenses are met by parents with case-by-case contributions from public funds.—Ed.

the case with the latter. Often the endeavors of self-sacrificing and committed individuals do not bring adequate fruit because of administrative difficulties.

Prevention

An ounce of prevention is worth a pound of remedy. As far as specific disabilities are concerned this is certainly so. Moreover the fact that incidence of SLD is likely to increase, forces us to seek preventive measures.

At the same time it seems evident that primary (causal) prevention represents many problems. It would have to deal with genetic mechanisms and with minimal brain injuries. The former is, for the time being, methodologically and organizationally not feasible. The latter, from a theoretical point of view, is more accessible but in practical terms we are still at the beginning of a very long road. From this point of view, prenatal dispensaries for pregnant women and great improvements in perinatal and postnatal care of infants should be stressed. Also systematic follow-ups of so-called at-risk children (which are carried out in Britain, Czechoslovakia, and elsewhere) are already bringing their first positive results.

Factors which have an impact during the life of the child and which to a great extent form a prerequisite for the manifestation and development of the disability (e.g., deprivational and neuroticizing factors) are more accessible to prevention. This is also true of other factors which have a non-specific impact and which we have here designated as "aggravating" (socio-cultural, health, motivational, and organizational) factors. It is in this area that more intensive preventive endeavors can and should be concentrated.

In this context the more extensive education of the public as well as the education of officials in public administration, finances, etc. are a pressing need.

An important aspect of prevention is of course the timely screening out of high-risk SLD children. For the time being we consider it an organizational and diagnostic success if children with SLD are found during their first year of school. Ideally, this should take place at a preschool age, when not a remedial but a special preparatory program could be organized by which the child would be protected from the neuroticizing experience of lack of success in school.

Work in this area, as we have already mentioned, is rapidly developing and existing results indicate, that the predictive value of test batteries is satisfactory. It has been found that "false positives are less likely to be hurt

by unnecessary treatment than are the undetected high-risk children by neglect," (M. L. Trusdell in Newell and Trusdell 1974).

We can thus assume that future development will further transfer the focus of our endeavors from therapy to the area of the prevention of disabilities.

Conclusions

The right of education and equal opportunity for all, so often solemnly proclaimed, would sound very unconvincing if children who are handicapped by their specific learning disabilities were not included.

Let me finish with two more quotations which express my experiences and views better than I would be able to do it myself:

T. D. Hagger (1976), referring to the Interim Committee for the School Commission in Australia in 1974: " . . . the Committee laid emphasis on the right of every child, within practicable limits, to be prepared through schooling for full participation in society, both for his own and for society's benefit"; and M. B. Rawson (1975):

> We have, on the one hand, the universals of human structure and functioning, of the nature of language, and of the urge to personal growth and its nurturing. On the other hand, we have first the differences in individual spoken languages, their basic writing systems and particular forms, and secondly the almost infinite variety of capacities and limitations of individual learners. If we can come to terms effectively with these problems of unity in diversity, whatever our linguistic media of exchange, we shall by one more significant endeavor advance the understanding on which to build the One World which is essential to the survival and fulfillment of us all.

Recommendations

As we have seen, specific learning disabilities are a world-wide problem which is acute in the developed countries and which awaits the developing ones. What is to be done now, to find a staisfactory solution to the problem? Which trends should be supported?

From what has already been said we can now formulate several recommendations. The sequence in which they will be mentioned here is not necessarily indicative of their importance. That depends on local conditions.

1. It is necessary to bring the problem of SLD to the attention of the public throughout the world. This should include countries where the education of children is not yet a pressing social task. A great deal of education is necessary also in countries where the problem is well-known and acutely felt. It is necessary to form and finance social institutions which would competently provide remedial therapy and organize the prevention of disabilities.

Through the mass media it is also necessary to educate the general public. In all countries (with some rare exceptions, such as the Netherlands perhaps [J. J. Dumont 1976]) there still exists a general distrust of "special educational" measures. They are often accepted with "suspicion" or with a negative attitude, as a social stigma of the child and the family.

2. It would be very helpful if an exchange of knowledge and experience in this field on a broad transnational basis could be achieved. "One encounters frequently some sense of isolation from Dyslexia-International, even where within a country there are contacts and conferences" (M. B. Rawson in McLeod et al. 1972).

a. In the area of diagnosis a uniform assessment of basic academic skills—reading, spelling, arithmetic—should be introduced. Also the use of a uniform special test battery (still to be developed) should be recommended.

b. In the area of therapy we think it especially important to stress the necessity of team work of specialists from various areas of science—and to provide the organizational foundation for such cooperation. Another principle which should be stressed is the necessity of an individual approach to each afflicted child and the individual nature of all remedial procedures.

This is closely connected with the necessity for a new approach of teachers towards remedial teaching and their special training for this task, both in pre-graduate and post-graduate study. The same is true for psychologists, child psychiatrists, neurologists, and others.

c. In the area of prevention the principle of a timely screening of children suffering from SLD should be stressed. At the same time it seems indispensable to continue to develop methods for finding high-risk children at the preschool level. From this follows the necessity of providing the organizational foundation for such timely screening and of organizing timely remedial measures.

Measures to counteract cultural deprivation, increase the motivation to learn, improve health care and others are also important preventive means.

3. Integrational endeavors in this field should receive all support. I have in mind especially support of international meetings and conferences on this

subject, since they represent an effective help in spreading the most developed diagnostic and therapeutic methods. It is necessary to support the unification of terminology in this field, as well as assessment criteria, diagnostic procedures, etc. We are still facing the problem of reliably determining the actual number of children suffering from SLD.

4. Finally, we place great importance upon future international research projects which would concentrate upon obtaining more knowledge as to what is essential and what is accidental in SLD, i.e. what is "in the child" and what is dependent on the language structure, socio-economic conditions in a given country, school systems, organization of various services, etc. There have been many individual studies undertaken, but controlled, cooperative transnational studies have been very few and far between, although this seems to be the most efficient path to rapid advances.

The two or four or ten percent of the world's population of afflicted children certainly deserve this much!

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Lateralized Tachistoscopic Recognition, Cerebral Dominance, and Dyslexia

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Abstract

This paper reports on the use of lateralized tachistoscopic recognition accuracy and recognition latency measuring procedures for studying functional asymmetries of the cerebral hemispheres. Specific results bearing on the nature and number of relative specializations of hemispheric function are presented, as well as results bearing on the question of cerebral dominance and serial memory in dyslexia.

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There can be no doubt that individual differences in cerebral organization may provide clues to the bases of deviations of academic performance. One aspect of cerebral organization long hypothesized to have implication for academic performance is what Orton called "cerebral dominance"—today more fashionably called "cerebral asymmetries of cognitive function."

Most persons possess left-hemisphere dominance for language processes and a somewhat less certain right cerebral dominance for the appreciation and memory of spatial information. My research has been concerned with studying cerebral dominance characteristics through the technique of lateralized tachistoscopic presentation of stimuli requiring either linguistic or spatial analysis. I believe that the technique affords a valuable approach to the assessment of cerebral dominance in individual subjects, although there re-

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This paper was presented at the 27th Annual Conference of The Orton Society, in New York City, November 1976, as part of a symposium entitled Individual Variations in the Cerebral Organization of Cognitive Functions in Man.

The work reported in this paper was supported by a grant to the author from the National Institute of Neurological and Communicative Diseases and Stroke (NS-10214-04 and NS-10214-05).

mains the need for further validation of the technique for individual psychodiagnostic use.

Lateralized Tachistoscopic Studies of Hemispheric Specialization

The first two studies I will describe are clearly more basic than applied, and their relationship to deviations of academic performance is not very direct. However, they do illustrate application of lateralized tachistoscopic recognition and reaction-time procedures to questions regarding the nature, and number, of cerebral dominances. Subsequently, I will briefly describe the results of some applications of this and related procedures to the question of cerebral dominance in dyslexia.

Lateralized tachistoscopic presentation as a technique for studying hemispheric specializations of cognitive functions was pioneered by Sperry and his colleagues (Sperry 1968) at Cal Tech, in their monumental studies of split-brain patients. The technique takes advantage of the fact that the visual system of man transmits information seen to the right of a central fixation point exclusively to the left cerebral hemisphere, and information to the left of a central fixation point exclusively to the right hemisphere.

Sperry and his co-workers found that patients who had been surgically deprived of the neural connections between the two hemispheres were unable to report words or objects transmitted from the left visual half-field to the right hemisphere, but could report such stimuli transmitted from the right visual half-field to the left, language-processing, hemisphere.

This lateralized tachistoscopic presentation has since been applied to the study of cerebral dominance in persons with intact interhemispheric connections. It appears that, even in such subjects, there is enough *degrading* and *slowing* of stimuli channeled through the non-dominant hemisphere to produce discernible superiorities of the dominant hemisphere for processing a particular type of stimulus material. It is important, in this procedure, that the tachistoscopic exposure be briefer than the latency of eye movements (less than 150 milliseconds [msec]) and to know that the subject actually fixated on the center of the visual field during presentation of the lateralized stimulus material. In our laboratory, we control the subject's fixation by requiring him to report what we call fixation-control digits, single numbers that appear at fixation along with the lateralized stimuli.

We have used letters and words as verbal stimuli in a number of studies where simple accuracy was measured. Thus, upon an auditory "ready" signal, the subject focuses on the fixation point, and about one second thereafter a fixation-control digit and a lateralized word or letter are flashed for less than 150 msec. The subject is then required to report the fixation digit and reports, if he can, what letter or word he thought he saw. Two versions of this task are used. In one, verbal stimuli are presented randomly to the left or right of fixation (unilateral presentation), and in the other, stimuli are presented to both the left and right visual half-fields (bilateral presentation).

In reaction-time studies, the time required for reporting the stimulus material (vocally or manually) is measured. All presentations in reaction-time studies are of the unilateral type, and stimulus sizes and exposure times are chosen to allow essentially perfect accuracy in recognizing the stimuli. Additionally, it is necessary to have the subject report the lateral stimulus first and then to report the fixation-point digit.

The typical result of such procedures with normal subjects is that stimuli channeled to the left cerebral hemisphere (right visual half-field stimuli) are recognized better and faster than stimuli channeled to the right hemisphere (left visual half-field stimuli). Furthermore, this result has been obtained for written languages having different directional characteristics than English and for speed of naming non-alphanumeric stimuli. For example, we have found that over 90 percent of right-handed subjects name familiar, simple-object drawings, or even pure color patches, about 30 msec faster when the stimuli are channeled to the left hemisphere than to the right hemisphere.

So much for general methodology. Now, the best documented phenomenon of cerebral dominance is the preeminent lateralization of language processes to the left hemisphere. Yet, the basis for this dominance has been a matter of conjecture. Some older hypotheses, such as differential hemispheric blood supplies, or differential language development, secondary to handedness, can be shown to be incorrect or inadequate.

Recently, it has been suggested that cerebral dominance may result from anatomic asymmetries in the size of the auditory association areas of the left and right temporal lobes. Geschwind and Levitsky (1968), Wada, Clarke, and Hamm (1975), and Witelson and Pallie (1973) have concluded from their postmortem studies of substantial samples of brains, that the auditory association cortex of the left hemisphere is clearly larger than the homologous area of the right hemisphere in most specimens. And this appears to be true of neonatal brains as well as of adult brains. Further, the incidence of larger

right than left hemisphere auditory association areas approximates the usual estimates of right hemisphere language dominance of about 10 percent. These investigators suggest, therefore, that this anatomic asymmetry of an area also known to be critically important in language function may be the condition which usually endows the left hemisphere with language preeminence.

It would seem that functional evidence regarding this hypothesis could be secured by studying the congenitally deaf. If left hemisphere dominance depends on the innate superiority of left hemisphere auditory association cortex, then people who have never had auditory language experience would not develop left hemisphere language dominance. On the other hand, if the superiority of the left hemisphere derived from some other factor or factors, then left hemisphere dominance should be unaffected by deafness. It is of interest that Sarno, Swisher, and Sarno (1969), on the basis of an aphasic-like disturbance in sign language processes in a congenitally deaf patient who had a left hemisphere lesion, concluded that the left hemisphere subserves communicative functions in the congenitally deaf, just as it does in the hearing. The *visual* input methods of studying language laterality allowed us to assess this question in young, bright, congenitally deaf persons in a systematic manner that could not be attained through the study of any single clinical case (McKeever et al. 1976).

Subjects were 18 congenitally deaf students and 18 hearing controls at Gallaudet College in Washington, D.C. All were female, right-handed, and all, including controls, were proficient in American Sign Language. (American Sign Language is the manual communication system used by the deaf. It includes a manual alphabet which translates the English alphabet, and conventionalized signs which can represent words or whole ideas.) None of the deaf subjects had any history of additional handicaps. We administered three tachistoscopic tasks. These were unilateral word recognition, bilateral word recognition, and bilateral American Sign Language (ASL) recognition tasks. I have already described unilateral and bilateral word recognition tasks. The ASL task presented drawings of unimanual and bimanual hand configurations selected from the ASL flashcards of Hoemann and Hoemann (1973). The ASL stimuli were presented bilaterally, i.e., with two different stimuli presented on each exposure.

Twelve different unimanual (letter) pairs and 12 different bimanual (sign) pairs were administered twice, each specific letter and sign channeled equally often to the left and right hemisphere. Some modification of our usual procedure *was* required because of the subjects' deafness. The ready

signal was provided by a small vibratory stimulus for all subjects. All signed instructions, and signed response recording, was done by Dr. Harry Hoemann, who is an extremely fluent user and translator of ASL, and along with Allan VanDeventer and Vicki Florian, one of the co-investigators.

The results showed that on all tasks the hearing group showed greater cerebral asymmetries than the deaf. For the hearing, there was significant left hemisphere superiority for both unilateral and bilateral word recognition, and significant right hemisphere superiority for ASL recognition. The deaf showed significant left hemisphere superiority only on unilateral word recognition, and even this was significantly smaller than that of the hearing group. Bilateral word recognition performances were virtually identical for the two hemispheres. On the ASL recognition task, the hearing subjects showed significant right hemisphere superiority, while the deaf showed a nonsignificant hemispheric difference. Multivariate analysis showed significantly lesser asymmetries across the three tasks for the deaf.

Congenital deafness, then, *does* result in greater ambilaterality of hemispheric processes involved in the recognition of English words and ASL. It is important to note, however, that this greater ambilaterality was not associated with reduced overall processing capacity. The deaf showed no deficit performance at all, recognizing as many stimuli as did the hearing.

The fact that ASL stimuli showed a significant right hemisphere superiority for the hearing suggests that this task requires substantial spatial analysis of the type for which the right hemisphere is normally more specialized than the left, despite the fact that hearing subjects undoubtedly translate the signs into acoustical English forms in reporting them. This result is not as surprising to us as it was when we first got it, because Bryden and Allard (1976) have since reported that *right* hemisphere superiority obtains for the recognition of *English* words when they are written in extremely fancy and complex script. Thus, it appears that the presence of heavy spatial processing demands in so-called "verbal stimuli" can yield left visual field superiorities. The overall results, then, support auditory association area asymmetry as the major basis of left cerebral dominance for language, and suggest that the deaf may be less laterally specialized for spatial processing as well.

The second study I wish to describe (Suberi and McKeever 1976) illustrates the application of the lateralized tachistoscopic procedure to the study of the right hemisphere superiority of spatial function. Although many types of stimuli have been tachistoscopically administered in efforts to show

right hemisphere superiority of spatial function—for example, people have used random patterns, dots to be counted, dots to be located, geometric forms, Bender-Gestalt figures and the like—a recent review, by Allen Van-Deventer (VanDeventer 1976) of over 115 studies showed the task most successful in demonstrating a right hemisphere superiority is one measuring the speed of recognition of previously memorized faces. Rizzolatti, Umilta, and Berlucchi (1971), and Geffen, Bradshaw, and Wallace (1971), and others, have found clear right-hemisphere superiorities for face recognition using manual reaction-time methods. The methodology is to have subjects study and memorize pictures of two faces and then, on a large number of reaction-time trials, to discriminate the memorized, or target, faces from two non-target faces, i.e., faces they had not memorized. Subjects indicate on each trial whether the tachistoscopically presented face is, or is not, one previously memorized, by pressing a "same" or "different" button. An important aspect of our study concerned what appears to be a third cognitive functional asymmetry of the brain and a second type of right hemisphere dominance—namely, a right hemisphere superiority for the memory storage of emotional or affective aspects of stimuli and experiences.

The notion that the right hemisphere may be more involved than the left in storing affective experiences is suggested by diverse, though rather meager, clinical and experimental evidence. In the interest of brevity, I will not enumerate this evidence. We wished to determine if differential magnitudes of right hemisphere dominance could be shown in recognition latencies for emotionally expressive, as opposed to emotionally neutral, faces. No systematic study of this question had been carried out previously.

Sixteen stimulus faces were used in the experiment. They were posed by Bowling Green State University theater majors. In order to avoid any obvious isolated cues to recognition, all were free of apparent facial hair, did not wear glasses, communicated the intended affects without opening their mouths, and wore hoods to cover their hairlines. Each model projected a *neutral* expression, a *happy* expression, a *sad* expression, and an *angry* expression. A reliability study, employing 20 female undergraduates, showed that the intended differences between neutral and emotional pictures was apparent in 98.8 percent of the judgments, and that the distinctiveness of the three types of emotional expressions was apparent in 97.9 percent of the judgments. Basically, the study revealed very high congruence between *intended* and *perceived* affects.

In the face-recognition study proper, 72 female undergraduates served as

subjects. Twenty-four of them memorized two neutral faces, and subsequently discriminated these from two other neutral faces, on the lateralized reaction-time trials. This was labeled the GROUP NEUTRAL condition. A second group of 24 subjects, labeled GROUP EMOTIONAL, memorized two *emotional* faces and discriminated them from two other *emotional* faces; target and non-target faces all projected the same emotion for three subgroups of eight subjects each, in this condition. A final group of 24 subjects, labeled GROUP MIXED, consisted of 12 subjects who memorized neutral faces and discriminated them from emotional faces, and 12 subjects who did the opposite. Counterbalancing was applied in all groups such that each of the faces appropriate to that group served equally often as target and non-target faces.

The results showed a right hemisphere advantage in all groups, the advantage amounting to 11.5 msec in Group Neutral, 18.1 msec in Group Mixed, and 26.2 msec in Group Emotional. These right hemisphere superiorities are significant for Group Mixed and Group Emotional and slightly short of significance ($p < .10$) for Group Neutral.

When we looked at the performances of the 12 subjects in Group Mixed who had engaged in the same memorizing task as the Group Neutral subjects—i.e., at the 12 Group Mixed subjects who had memorized *emotional* faces (the same memorizing task as Group Emotional)—their right hemisphere advantage was similar to the 26.2 msec superiority of Group Emotional, they showed a 24.6 msec right hemisphere advantage. Furthermore, subjects shown the non-target faces after the experiment consistently indicated surprise that the faces looked "like that," and were not even sure how many different non-targets they were exposed to on tachistoscopic trials. These facts suggest that the major determinant of hemispheric latency differences was whether the *memorized* faces were emotional or neutral. Consequently, we compared the mean performances of the 36 subjects who memorized *emotional* faces to the 36 who memorized *neutral* faces. The means showed an 11.5 msec right hemisphere superiority for those memorizing *neutral* faces and a 25.7 msec right hemisphere superiority for those memorizing *emotional* faces. This seems to indicate that emotional cues were significantly better *preserved* in the right hemisphere. The right hemisphere showed significantly faster recognition than the left for both neutral and emotional faces, but the right hemisphere superiority was significantly greater for emotional faces.

We do not believe that an explanation solely in terms of right hemisphere superiority in spatial ability fits this data. There was no significant difference

in overall reaction time between subjects memorizing neutral and emotional faces, so that one cannot entertain the hypothesis that emotional faces are simply more spatially complex than neutral ones. Although there is a need for further study of the possible relationship of visuo-spatial processes to affective memory storage processes, we are inclined to the view that they are not necessarily positively related. Indeed, the bulk of evidence suggests that females are only weakly right hemisphere dominant for spatial processing and strongly right hemisphere dominant for affective memory storage, while the converse pattern has been suggested for males.

So much for basic questions. I will now describe some results from our studies of dyslexic adolescents.

Cerebral Dominance in Dyslexia

Orton proposed that dyslexia resulted from incomplete or reversed cerebral dominance. The methods available for assessing cerebral dominance at the time were basically motoric. Thus, he defined mixed dominance in terms of inconsistent lateral preferences of the hand, eye, foot, etc. Orton recognized that these indicators were not ideal, but they were the only ones available at the time. Allan VanDeventer and I (McKeever and VanDeventer 1975) decided to apply tachistoscopic tasks and a dichotic-digits recall task to dyslexics to see if we could find evidence of weak or aberrant cerebral dominance for simple language stimulation. The tasks we used were unilateral word recognition, bilateral word recognition, vocal reaction time for naming symmetrical capital letters, a manual reaction-time task, in which subjects indicated by pressing or not pressing a button, whether a single dot had or had not been flashed in a visual half field, and, finally, a dichotic-digits recall task.

The subjects were nine adolescent male dyslexics and nine normal-reading male controls. The mean age of the subjects was 13.8 years with a range of 12 to 19 years. The dyslexics were chosen for the clarity of their specific dyslexia and represented the most clearly dyslexic clients being served by the Bowling Green State University Reading Center at the time. Five of the dyslexics had family histories of reading problems in the previous generation.

The results, first of all, showed the dyslexics' performances on all tasks, except dot-detection speed, to be significantly inferior to the controls. As to indications of cerebral dominance on unilateral word recognition, the dys-

lexics' recognition level for words channeled to the right hemisphere was the same as for words channeled to the left hemisphere. Further, their left field recognition level was much closer to that of the controls than was their right field recognition level. One might jump to the conclusion, therefore, that the study supported the Orton hypothesis of weak dominance. However, on bilateral word recognition, on vocal latencies for naming letters, and on dichotic digits, there was no group-by-hemispheres interaction and the left hemisphere was clearly superior to the right in both groups.

The absence of left hemisphere superiority in unilateral word recognition seems more parsimoniously viewed as a consequence of impaired left-hemisphere function. The unilateral word recognition performance of the dyslexics, with much greater impairment for stimuli delivered to the left than to the right hemisphere, is highly similar to that reported by Shai, Goodglass, and Barton (1972) for left hemisphere-*damaged* patients.

A second major aspect of the data was the clear evidence of auditory memory impairment seen on the dichotic-digits recall task. This, as well as other aspects of the data, which are too involved to explain briefly, led us to wonder if adolescent dyslexics might be afflicted with a *general* memory impairment, or alternatively, a *sequential* memory problem. The impaired dichotic-digits recall could not inform us on this question, because, although the task is a free-recall task, subjects normally preserve the serial order of the digits to a high degree. In other words, there was a confounding of general and sequential memory on the task.

This led us to a further nontachistoscopic study, just completed, by David Holmes and me (Holmes and McKeever 1976). The subjects were 15 adolescent dyslexics and 15 normal-reading controls. The specific question was whether dyslexics suffer from a general, or from a sequential, memory impairment, and whether such impairments exist for both verbal and spatial tasks. Two types of to-be-remembered materials were employed. These were *words*, material presumably better processed by the left hemisphere, and *faces*, material presumably better processed by the right hemisphere. Word stimuli differed for each dyslexic subject, the words having been chosen on the basis of his demonstrated immediate ability to read them, and the same 20 words were then used with a matched control. The faces to be remembered were graduation photographs of 20 college students. Under the general memory condition, the subjects studied each word (or face) for three seconds, then the next word (or face), with the instruction that he would have to remember them and pick them out from a larger series of words (or

faces) afterwards. The recognition task required him to pick out the 20 stimuli from a deck of 40. Mean general recognition scores for the two groups were virtually identical—16.5 words by dyslexics and 16.8 words by controls. For face recognition, the dyslexics recognized 14.9 faces out of 20 and the controls 15.2. These differences do not approach statistical significance.

On the sequential memory tasks, each subject viewed 20 new words (or faces) under the instruction that he would subsequently be asked to *reproduce the order* in which the stimuli were viewed. The score of each subject was the rank-order correlation, measuring the overall similarity of the *true* order and the subject's ordering. For faces, the two groups did not differ. Dyslexics had a mean rank-order correlation of .41, controls .43. For words, however, the serial ordering of the dyslexics was significantly less accurate than that of the controls, .48 for dyslexics as opposed to .66 for controls, and this difference is significant.

To summarize, our view of chronic dyslexia is that it is not due to atypical hemispheric dominance, and failures of the normally dominant hemisphere to suppress the reversed images of letters seen by the right hemisphere. Our data suggest that dyslexics such as we have studied are characterized by normal left hemisphere dominance and normal visual responsivity, as indicated in the dot-detection task. The fact that their word recognition performance is more normal for the left than for the right field under *unilateral* presentation suggests that interhemispherically transferred stimuli may by-pass, or largely by-pass, a dysfunctional left hemisphere locus involved in the processing of word information delivered directly to that hemisphere. Under *bilateral* word presentation (which, incidentally, we believe to be a more sensitive test of lateral dominance), dyslexics show no change in right visual field recognition levels but drastic drops in left visual field recognitions. Thus, under conditions of word input into *both* hemispheres, we believe the dominant, though impaired, left hemisphere allows preferential access to visual-auditory translating mechanisms, to those stimuli directly received, rather than to those interhemispherically transferred. A second major defect, in addition to some dysfunctional visual-associative cortex in the left hemisphere, appears to be impaired sequential verbal memory. The combination of these defects—markedly suppressed left field recognition under normal bilateral reading conditions and an unstable preservation of the sequence of words just read—would seem sufficient to disrupt the reading process. It should be understood that we do not believe there are no "perceptual" or right hemisphere impaired dyslexics. We do believe that

postadolescent dyslexics are more likely to have the type of dyslexia I have described. Finally, no defect in right hemisphere processes has been suggested by our studies to date.

I must add that while we have not found support for Orton's hypothesis of weak cerebral dominance, Orton was one of the first to propose that dyslexia involved a symbolic disorder of serial memory, and our data do support that hypothesis.

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Language Proficiency and Lateral Position in the Classroom

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This paper not only makes a contribution to the mosaic of scientific knowledge of the brain and nervous system, but suggests implications of practical value. Observant, experienced teachers know empirically that some youngsters learn best, and perhaps only, when seated front-center, right before the teacher's desk. Such children need to have the eye contact, or to be in quick arm's reach, or to have distractions screened out. Drs. Bakker and Van Rijnsoever give evidence here that, for many children, taking in and remembering the message is dependent on their physical placement to catch most effectively the stream of sound. This is important to consider in the popular open classroom. Although many children can adapt readily to less-than-perfect physical learning conditions, for some we must "re-invent the wall," not to climb, but to provide a place to call "home." The theoretical re-inforcement presented in this paper proves that such boundaries can also provide source and direction for sound as part of some children's currently needed sensory security and enhance the efficiency of their auditory intake.

—Editor

Development of Listening Techniques

Hemispheric asymmetry of function is an important issue in neurology, psychology, and special education. The neurologist may wish to know which hemisphere primarily mediates language in candidates for neuro-surgery. Retarded cerebral lateralization could inform the educational psychologist about the etiology of a reading problem.

However, since looking into the black box is not possible one is confined to indirect measures of hemispheric asymmetry. One such measure is hand preference. Orton's well known model of language disability is based on the issue of lagging cerebral dominance which he thought to be reflected in atypical hand preferences. Today we know that hand preference is not the most reliable measure for predicting functional asymmetry of the brain. Some 20 years ago a new instrument was developed to explore hemispheric dominance for lingual and nonlingual functions. Kimura (1961) showed the

usefulness of Broadbent's dichotic listening technique for psychological, neurological, and educational diagnosis. These listening tests provide the subject with different bits of information simultaneously presented to each ear. For instance, the digits *5, 3, 9* can be presented to the right and the digits *2, 6, 1* to the left ear in such a way that the subject hears *5* in his right ear and simultaneously *2* in his left, followed by the pairs *3/6* and *9/1*.

Besides digits, meaningful words, nonsense words, consonants and vowels can be used as verbal stimuli in dichotic listening, as well as nonverbal stimuli such as bits of melodies, environmental sounds, and tapped out patterns. Generally right ear advantages are found subsequent to verbal stimulation and left ear advantages following nonverbal stimulation. This is a rule of thumb. Recent evidence indicates that the lateral differences depend not so much on the verbal or nonverbal nature of the stimuli as on the strategies activated to process the information (Bogen 1975; Bever 1975).

In an effort to answer the question of the extent to which auditory asymmetry measures hemispheric asymmetry of function Kimura (1961) related observed ear advantages to the outcomes of unilateral intracarotid sodium amytal injections, viz. the temporary loss of hemispheric functions. For most patients she found right and left ear advantage associated with respectively left and right hemispheric control of speech. It is clear that dichotic listening techniques are valuable tools for examining the nature and development of cerebral asymmetry of function.

It was believed for some time that dichotic stimulation, viz. simultaneous presentation of information to the ears, constitutes a necessary condition to generate ear asymmetry. In case of dichotic stimulation, impulses travel along ipsi- and contralateral pathways since each ear is bilaterally innervated. Rosenzweig (1951) proposed that there is a point of overlap between the two pathways and that at this point the contralateral one, which is functionally stronger, may occlude impulses arriving ipsilaterally.

However, it later became evident that ear asymmetry can be demonstrated subsequent to monaural presentation of information (Bakker 1967; Simon 1967; Bever 1971; Doehring 1972). In monaural listening the ears are stimulated successively; for instance the right ear may be presented a series of digits followed by recall whereupon the left ear is presented a series followed by recall. Since the messages are non-competitive in monaural listening, occlusion mechanisms cannot sufficiently explain the subsequent ear asymmetries. The right ear advantage following monaural presentation of verbal information is most likely due to the contralateral pathway being function-

ally strongest and to the contralateral left hemisphere being specialized for the processing of lingual information.

Both dichotic and monaural listening tests have proved to be valuable in investigating the neuropsychological substratum of language disorders. Orton (1937) spent many years studying this subject in the twenties and thirties. Since he assumed that weak hand and foot preferences reflect weak cerebral dominance he tried to find associations between the lateral preferences and language disability. A recent neuropsychological theory of specific reading disability is that of Satz and his associates (Satz and Sparrow 1970). His model predicts a relation between language laterality as reflected in dichotic ear asymmetry and reading proficiency, especially at older schoolages. Our own work has shown the laterality-reading patterns to be different at successive stages of the learning-to-read process (Bakker 1973; Bakker, Teunissen and Bosch 1976).

It should be stressed that the two listening techniques discussed so far are not goals in themselves but the means to explore hemispheric asymmetry of function.

Seldom are both dichotic and monaural listening found in daily life situations. The norm is binaural listening, viz. hearing one message with both ears.

A New Listening Technique

In common listening, one binaurally hears vocal and nonvocal sounds generated at some point in space. That point is usually located at the front, back, right or left side of the listener. One may ask whether the location of sounds has any effect on listening performance.

It has, as is recently shown by Bertelson, Morais, and Hublet in Brussels. In a first experiment Morais and Bertelson (1973) presented pairs of consonant-vowel (CV) syllables, one of each pair simultaneously over two of the three loudspeakers. These speakers were situated in front, left, and right of the listener who kept his eyes directed to the front wall during presentation. Syllables presented through the frontal speaker were better recalled than those presented through the lateral ones, while syllables spoken at the right side were better recalled than those spoken at the left side. In a subsequent investigation (Morais 1975) speakers were situated left and right at 45 and 90 degrees from the medial plane. The results showed speakers at the 90-degree positions to produce better total recall and greater latero-spatial asymmetry

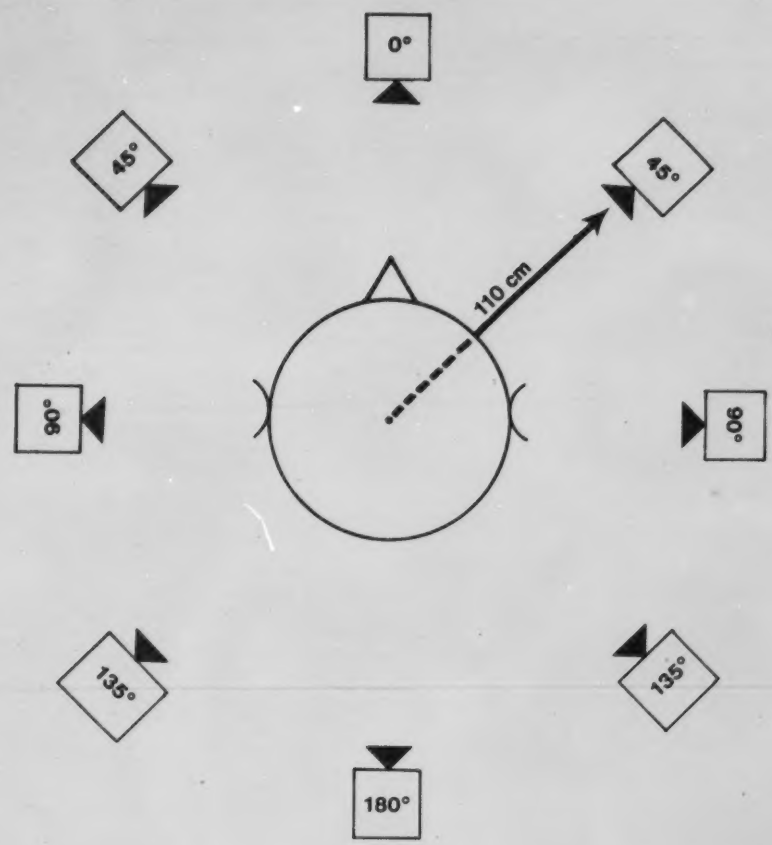


Figure 1. Positions of loudspeakers for investigating auditory-spatial asymmetry (after Hublet, Morais and Bertelson, in press).

than speakers at the 45 degree positions. Thus verbal information from directions perpendicular to the ears seems to be processed more proficiently and asymmetrically than similar information from oblique directions. In their most recent investigation Hublet, Morais, and Bertelson (in press) presented a high- and a low-pitched syllable simultaneously through one loudspeaker situated left or right at 0, 45, 90, 135 or 180 degrees from the medial plane

(Fig. 1). Subjects were required to identify the high-pitched syllable. A right-over-left side as well as a frontal-over-lateral side advantage was found.

In summary the Brussels group has shown latero-spatial asymmetry in the processing of competing and non-competing auditory-verbal information. Syllables spoken in the right-lateral plane are better identified than syllables spoken in the left-lateral plane. The right-side advantage may be related to right-ear advantage in dichotic and monaural listening though this association has still to be proven.

Practical Implications

The results of these investigations are not only of theoretical interest, but they also have significant practical importance. In daily life information is presented at various distinctive points in space. Take the case of the classroom where the teacher talks to his pupils and the pupils to each other. The basic arrangement of seats in Dutch schools is represented in Fig. 2. Most pupils looking toward the front wall hear the teacher speaking in the left-lateral space. Even when he walks through the classroom many children will hear his messages from the left. Regarding the outcomes of the Brussels studies one would predict that some children are disadvantaged in listening to the teacher due to their position in the classroom. The disadvantage may be greatest in situations in which highly specific signals have to be processed, as in writing from dictation.

The primary aim of an investigation we wished to do was to study the effect of spatial position in the classroom on the processing of spoken lingual information arriving from the left and right lateral planes. When we realized that possible latero-spatial differences may be related to hemispheric asymmetries of function as reflected in ear dominance we decided to administer a dichotic listening test, as well. Finally we felt that year after year taking the same spatial position in the classroom possibly affects the development of hemispheric specialization.

An Investigation

It was our intention to simulate, as closely as possible, classroom practice in writing to dictation. On the other hand, the test had to be sensitive enough to disclose lateral differences. It was decided, therefore, to present the children with pairs of identical and different one-syllable meaningful words,

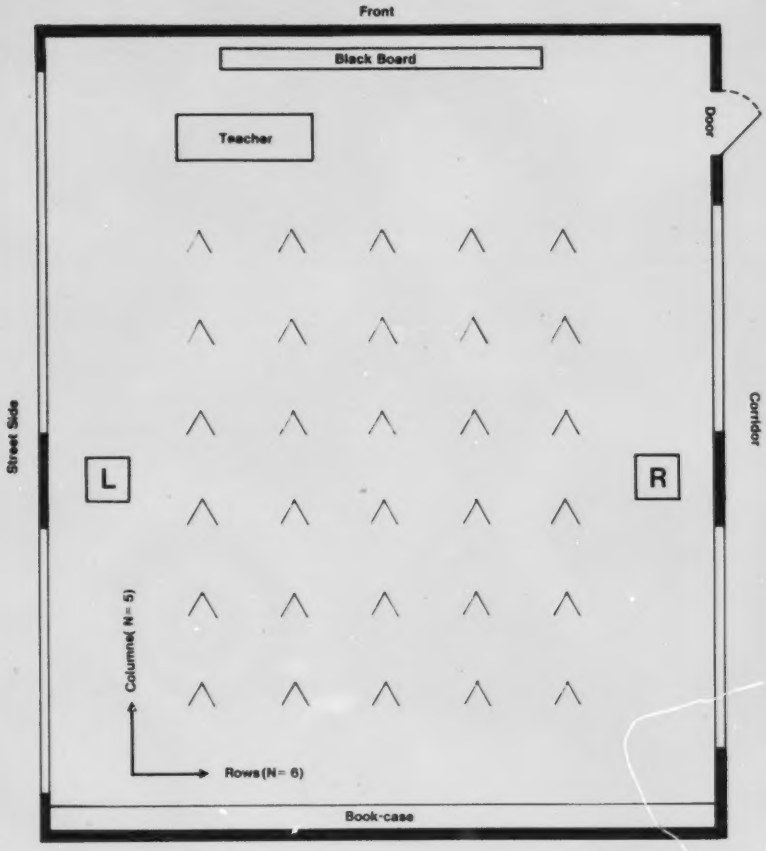


Figure 2. Basic arrangement of seats in the classroom; L and R: location of left and right loudspeakers respectively.

each pair at ear level spoken through one of two loudspeakers. The speakers were placed in the middle of the classroom, the left one at the outermost left (street) side, the right one at the outermost right (corridor) side (see Fig. 2). Sixty word pairs were presented through both the right and left loudspeaker in random order; four practice trials were given. Thirty word pairs were two by two identical. Thirty pairs were different, twenty in initial (p vs. d and d

vs. b) and ten in final phoneme (p vs. t). All items were taken from the list of most frequently used words (Uit Den Bogaart 1975). Each pair was spoken by a female speech therapist within two seconds at the level of approximately 70 dB. Inter-pair interval was about seven seconds.

Since vocal and nonvocal sounds usually invade the classroom from both the street and the corridor it was decided to have random playground noise superimposed to the word pairs in a two-to-one signal-noise ratio on both channels. The child had to indicate whether two words were the same or different by underlining either two small circles (same) or a circle and a cross (different) drawn on a form in front of him. Children were required to direct their eyes to the front wall during presentations.

In addition to the phoneme discrimination task, a hand preference (Harris 1958, subtest 2) and a dichotic digit test (see Bakker 1976) were administered. The second and fourth grade of a normal elementary school (socio-economic middle class) participated. Seats were arranged in rows and columns as indicated in Fig. 2. No auditory or physical defects were reported in any of the children.

Total errors by rows and columns.

Seats were arranged in six rows running from street to corridor side and in five columns running from front to back wall. Total errors were non-linearly related to row and column position in both grades as shown in Fig. 3.

Fewest errors are made in the middle rows and columns. Thus the most privileged place seems to be the point where the middle row and column cross, viz. the center of the classroom. The greater the distance from the center the more errors are made in both grades. This is shown in Fig. 4.

Second-grade pupils at the corners of the classroom make more than three times as many errors as pupils at the center. This ratio is approximately two-to-one in grade four. These differences are significant. The question is why the center is advantageous as compared with the corners. One explanation is that the total distance between center and speakers is smaller than the total distance between a corner and the speakers. Another possibility is that the center seats are privileged because the sounds are projected perpendicularly to the ears at these places. The angle between sound direction and transversal plane is larger for pupils at eccentric than for pupils at centric positions. Since in the present investigation angle of incidence is positively related to total distance from loudspeakers no definite conclusion as to the

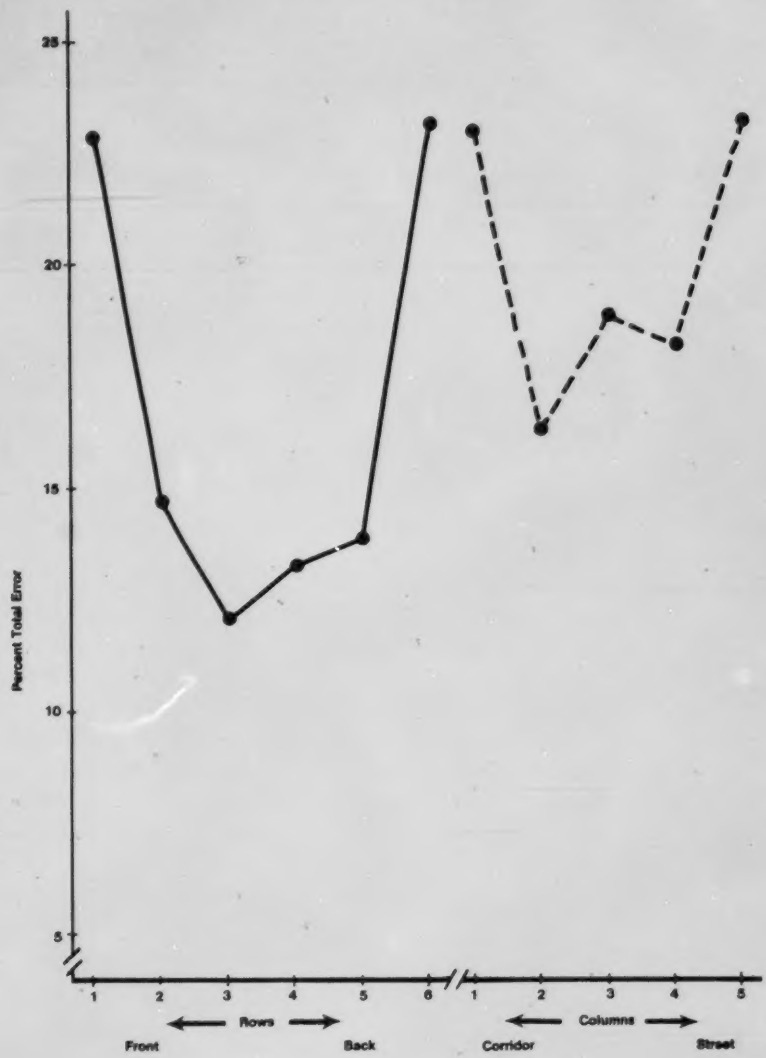


Figure 3. Total errors by row and column.

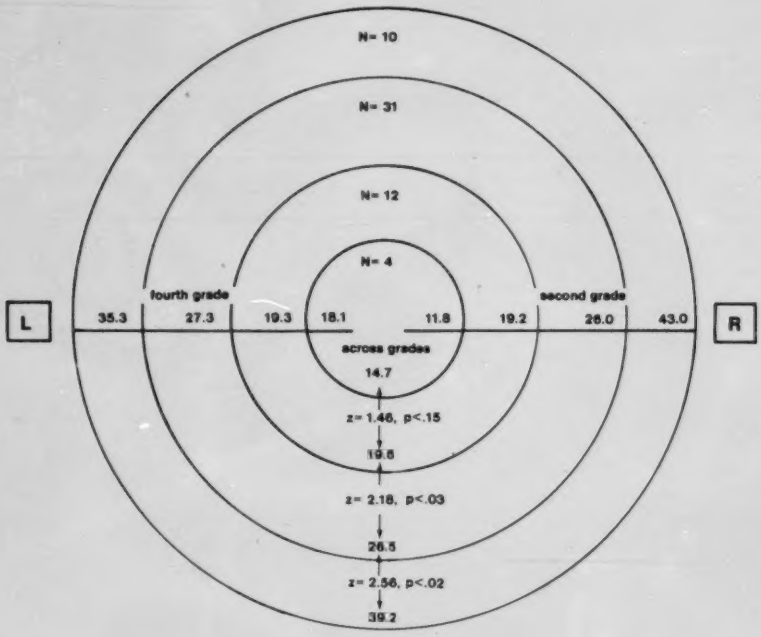


Figure 4. Percent total error as a function of concentric position in the classroom (two-tailed testing).

differential effect of distance and angle can be drawn. However, while distance was kept constant in the investigations of Bertelson and his group, they found perpendicularly projected information better processed than obliquely projected information (Morais 1975).

Thus the different performances of children seated at centric and eccentric positions in the present investigation are possibly related to size of angle under which the information is received. A quite different explanation would be that children at the center are more intelligent than children at the corners of the classrooms. In discussing this possibility with teachers we learned that pupils are not assigned seats at the center or corners on the basis of their intelligence level.

Right versus left lateral plane

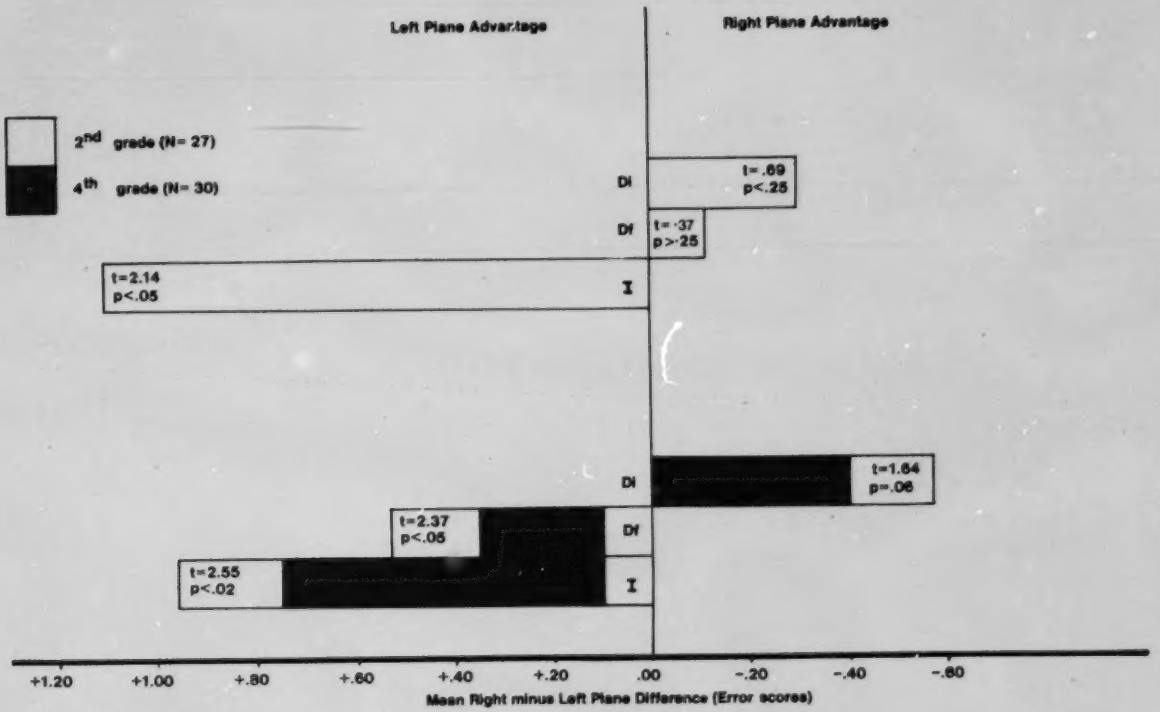
Subjects were required to indicate whether two words were different or identical. Earlier research show "different" and "same" responses to be differently lateralized. Morais and Darwin (1974) in a monaural listening study found different words better processed through the right than through the left ear, while the ears were equally proficient in the processing of identical words. In the present investigation words could be identical (I), different in initial consonant (Di) and different in final consonant (Df). Right-left differences were analysed for each of these categories separately. Right plane advantage was predicted to be greater for different than for identical words. Mean right plane minus left plane differences are represented in Fig. 5. Right plane advantage, significant in the fourth but not second grade, was found for words differing in initial consonant (Di). Significantly more fourth graders showed right plane than left and no plane advantage ($X^2 = 7.80, p < .025$).

Unexpected but significant left plane advantage was found for identical words (I) in both second and fourth graders. More second grade ($X^2 = 16.22$, $p < .01$, two-tailed) and more fourth grade ($X^2 = 6.20$, $p < .10$, two-tailed) pupils showed left plane than right or no plane advantage. Words differing in final consonant (Df) were better perceived by fourth graders when presented at the left side. It could not be proven, however, that more of these subjects showed left plane than right or no plane advantage ($X^2 = 4.20$, $p < .25$, two-tailed). No lateral plane advantage was found for Df-words in the second grade.

The results show that it makes a difference in which lateral plane words are presented. Presentation at the right side gives better results for words with different initial consonants, especially at older school ages. Left side presentation is to be preferred when pupils have to compare identical words.

In an effort to explain the differential word effect, one may consider that a physical-sound match suffices to make the correct "same" response in case two identical sounding words are presented. However, different physical sound patterns do not necessarily imply that one is dealing with different words. The word "task" means the same for an American and a Briton although the pronunciation is different. Higher level categorization (name

Figure 5. Lateral plane advantage for identical words (I, 2-tailed testing) and for words differing in initial (Di, 1-tailed testing) or final consonants (Df, 2-tailed testing) (figure opposite).


Left Plane Advantage
Right Plane Advantage
2nd grade (N= 27)
4th grade (N= 30)
DI
DF
I
t=.69
p<.25
t=.37
p>.25
t=2.14
p<.05
t=1.64
p=.06
t=2.37
p<.05
t=2.55
p<.02
+1.20
+1.00
+.80
+.60
+.40
+.20
.00
-.20
-.40
-.60
Mean Right minus Left Plane Difference (Error scores)

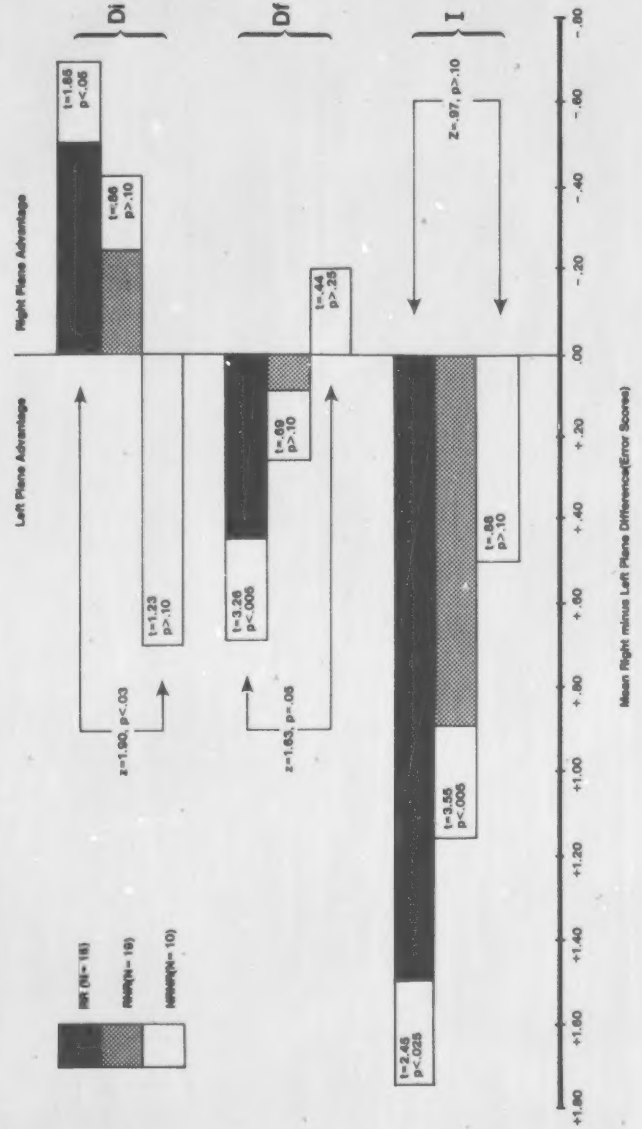
coding) is needed to arrive at the conclusion that words are different. Physical and name matching may primarily be controlled by the right and left hemispheres respectively (Posner, Lewis, and Conrad 1972), which would explain identical words, while requiring physical matches, to be better perceived if spoken in the left lateral space and different words, while requiring name matches, to be better perceived if spoken at the right. Words with the same initial and different final consonants (Df) may be somewhat confusing for a child using name and physical matches. The first parts of these words sound similar, which could generate physical matching; the final part sounds different, requiring comparison of names. The intermediate position of the Df-items in terms of physical and name matching may explain why lateralization in the perception of these words is moderate.

Latero-spatial advantage and hemisphere dominance

The proposed explanation for the differential effect of different versus identical words on latero-spatial advantage assumes these advantages to be related to hemispheric asymmetry of function. It is reasonable to predict an association between latero-spatial advantage and ear-plus-hand preference in case both advantages are functions of hemispheric specialization. Since a dichotic listening test and a manual-preference test had been administered, the relationship could be investigated in the present study.

A child's ear preference was classified as either right ear or non-right ear dominant. As is the practice, ear phones had been intra-individually changed halfway in the presentations. A number of children switched ear preference subsequently while others did not. Those children who demonstrated right ear advantage both before and after the phone switch were considered stable right-eared subjects, all others were considered non-right-eared subjects. Hand preference was also classified as either right (maximal right response on Harris' subtest two) or non-right (less than maximal right response). In an effort to make the laterality score stable, ear and hand preference categories were combined into right ear plus right hand (RR), right ear plus non-right hand or non-right ear plus right hand (RNR), and non-right ear plus non-right hand (NRNR). It was predicted that the RR-group would show greatest latero-spatial asymmetry, the NRNR-group weakest and the RNR-group

Figure 6. Lateral plane advantage for Di-, Df- and I-words by ear-hand preference group (1-tailed testing) (figure opposite).


Di
Df
I
Right Plane Advantage
Left Plane Advantage
t=1.85 p<.05
t=.85 p>.10
t=1.23 p>.10
t=3.26 p<.005
t=.69 p>.10
t=.44 p>.25
t=2.46 p<.025
t=3.55 p<.005
t=.88 p>.10
z=1.90, p<.03
z=1.63, p=.05
z=.97, p>.10
RR (N= 18)
RWR(N= 19)
WRWR(N= 10)
+1.80
+1.60
+1.40
+1.20
+1.00
+.80
+.60
+.40
+.20
.00
-.20
-.40
-.60
-.80
Mean Right minus Left Plane Difference(Error Scores)

moderate asymmetry in the processing of identical and different words. The results are presented in Fig. 6. The RR-group showed near significant left plane advantage for identical words and for words differing in final consonant together with significant right plane advantage for words differing in initial consonant. The NRNR-group, on the contrary, did not show significant plane advantages, either for identical or for different words. Finally, the RNR-group showed significant left plane advantage for identical words only. Latero-spatial asymmetry was significantly greater in the RR- than in the NRNR-group for different words, but not for identical words. The results thus show evidence of a relationship between latero-spatial and hemispheric asymmetry.

Additional results

Since in classrooms most messages and sounds are heard from one or the other lateral direction, one may wonder whether these directional inputs influence hemispheric dominance as reflected in ear and hand preferences. It was interesting in this respect to note that children having seats in the center of the classroom (two inner circles, see Fig. 4) tend to show lower between-ear differences and weaker right-hand preferences than children sitting more eccentrically (two outer circles). These tendencies are present in both grades two and four. Fig. 7 shows that fourth graders sitting in the center are significantly less lateralized than classmates sitting at the side. Second graders tend to differ similarly.

Center second graders tend to show weaker right-hand preference than side second graders (60 vs. 85 percent right handedness, $z = 1.36$, $p < .20$, two-tailed). These spatial position groups both show near maximal right-hand preference in the fourth grade (100 vs. 92 percent). Center groups, while having weaker lateral preferences, show better phoneme-processing performance than eccentric groups. It may be of interest in this respect that these inner groups were also found to show higher standard reading scores than the outer groups (6.42 vs. 5.53, $z = 1.48$, $p < .15$, two-tailed).

Conclusion

The results of the present investigation indicate that children sitting in the center of the classroom, as compared with their classmates sitting at the sides, show weaker lateral preference together with higher proficiency in the

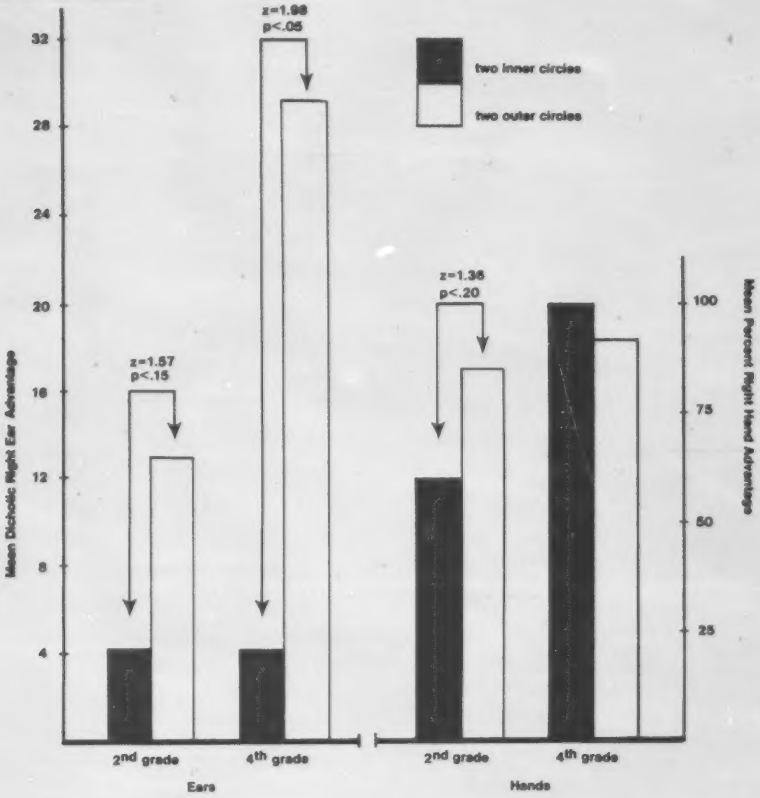


Figure 7. Dichotic ear and hand advantage by grade and concentric position in the classroom (2-tailed testing).

reception of spoken and written language. Weak lateral preference associated with high reading proficiency has been shown earlier (Bakker 1973).

A developmental effect is suggested by the positional differences being stronger in the fourth than in the second grade. We were told that children year-by-year tend to take similarly located seats. Thus the effect of spatial position on lateral asymmetry, and by inference on cerebral asymmetry, is possibly due to stereotype seat selection.

A latero-spatial (right vs. left plane) factor seems to be superimposed on the general positional effect (centric vs. eccentric positions). Identical words are better processed if spoken at the left side, words initially differing if spoken at the right side. This finding raises the problem of which place(s) a teacher should take in the classroom to instruct his pupils. The question is hard to answer here since one does not know how far the lingual processes tapped by the present tasks are aspects of school tasks like writing to dictation. However, it seems rewarding to reconsider the arrangement of seats and spatial position of the teacher in view of children's cerebral lateralization and lingual competence.

Acknowledgements

We wish to thank Mr. P. Borgman and his staff of the Johannes School in Amsterdam; the Audio-Visual Department of the Free University; Klaartje Slofstra, speech therapist in the City University; Marian Hoefkens; Marion Claushuis; and Paul Van de Broek for their valuable contributions in various phases of the investigation. We especially like to acknowledge the contribution of Mrs. E. J. N. Harding in Amstelveen who, at a meeting with parents of kindergarten children some years ago, mentioned the possibility that classroom position influences lateral ear performance. Thanks finally to Professor Bernard Tervoort of the City University for supporting the study and to Professor Willis Overton of Temple University who was willing to read the English text and to comment on it.

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60

Tests for Assessment of Language Development

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For about ten years I have taught a group of language-delayed children. It was necessary from time to time to evaluate the children's situation and to describe what sort of progress they had made. Some of the children were able to speak and some of them were not, but they had to learn how. With a child who cannot speak, how can you tell how much he can understand?

Tests to Assess Understanding of Language

Different tests have been made to describe the understanding of language in children and in adults. Coral M. Richard has developed a test of understanding of the spoken word (1). The test material consists of dolls' furniture, laid out in four rooms, which provide a setting for a number of articles in common use. The child is asked to carry out 20 instructions which increase in length and complexity. (Turn on the tap. Take the cake out of the oven. Find the plate in the top drawer in the bedroom, and put it into the oven.) Richard explains that the use of dolls' furniture is found to be very suitable for this kind of test; it is attractive to children of a wide age range. The objects are familiar to very young children so that the vocabulary is usually well-known.

Sister Mary Arthur Carrow (2) has made a test for evaluating the comprehension of linguistic structure. Carrow says that man's use of a linguistic code in communicating involves two major processes: comprehension and expression of language. In comprehending the meaning of language, two aspects of linguistic utterances are involved: the lexicon, or the vocabulary used, and the structure, i.e., the syntax and morphology. Most of the studies of language comprehension have focused primarily on the understanding of vocabulary and not on the comprehension of structure. Carrow decided to develop this test because there is a paucity of information regarding the development of auditory comprehension of language structure. The test was designed to permit the assessment of oral language comprehension without requiring

language expression from the child. It consists of a set of plates each of which contains one or more black and white drawings. The plates which test the structural contrasts provide two or three pictures, one of which represents the referent for the linguistic form being tested. The alternate picture(s) represent(s) the referent(s) for the contrasting linguistic form(s). The form classes and function words tested are nouns, verbs, adjectives, adverbs, and prepositions. There are morphological constructions, grammatical categories (case, number, gender) and syntactic structures. The present form of the test comprises 123 items. In administering the test, the examiner requests each child to indicate his responses by pointing to the right picture. A table shows the age at which 60 percent or more of the children passed each item. The 60 percent cut-off was arbitrarily chosen.

A smaller test for investigating grammatical contrasts has been made by Fraser, Bellugi, and Brown (3). The test comprises only ten items.

In Reynell's Developmental Language Scales (4) there are also items for testing understanding of language. The Reynell Test for testing verbal comprehension has two scales. Scale A has 9 sections and Scale B has 10 sections. It covers the age range from six months to six years. For scoring, the children have to play with some toys and look at different pictures. The test is made for investigating preverbal reactions, and to find out if the child has a certain vocabulary and if there is understanding of simple sentences. The Reynell Test is standardized.

Another instrument for investigating understanding of language is the Token Test by E. de Renzi and L. A. Vignolo (5). It operates with color, form, and size and is designed to detect the amount of aphasia in adults. It is too abstract to interest small children. (At the 1976 Convention of the American Speech and Hearing Association, Vignolo was asked if the test had been adapted for children. The answer was that it had not.) The instructions include: "Take the yellow square; take the white circle; take the big red square; take the black square and the red square." The person being tested reacts to simple verbal instructions by executing the order.

In Luria's investigation of receptive speech (6) there is something new. He starts with an examination of the ability of the patient to discriminate the speech sounds, the phonemes. The patient must indicate the phonemes which are presented to him by repeating, writing, or pointing to them on a list. In the next part of the test the names of a number of objects are mentioned to the patient. He must recognize the names and point out corresponding objects or explain in words or by means of gestures what the words mean.

The following part of his investigation is concerned with comprehension of grammatical structure: "Point with the pencil at the key" "Point with the key at the pencil" "Put a circle under the triangle." Finally there is an investigation of the patient's ability to grasp the general meaning of a written passage. It has not been possible for Luria to investigate receptive speech by means of a single kind of test procedure, nor do I think that one kind of testing language understanding is sufficient.

A New Test of Language Understanding

I have tried, together with K. Eichen (7) to develop a test to investigate language comprehension in children. It is made both for children who are able to use language and for children who do not speak and about whom it is difficult to say how much they understand of what they hear. We have tried to combine as many ways of investigating language understanding as possible. The test consists of six different parts, each of which is a subtest by itself.

The first of these is concerned with "Inner language" in the sense used by Myklebust (8). The concept of "Inner language" refers to the availability of verbal concepts regardless of whether or not the child talks. According to Myklebust, the child does not first learn the words and then the meaning; meaningfulness and experience precede the acquisition of words to symbolize the experience. Bricker and Bricker (9) say that "the child's development from inactive knowledge to symbolic knowledge about his world emerges from his direct interaction and action on his environment . . . before a child can manipulate symbols, language being one form of symbols, he must be able to manipulate the objects these symbols represent . . . the child who uses objects in the same way (e.g. banging) is not attending to the relevant attributes of each object."

Many children's games and toys demand the use of "inner language" and these may be used as a guide. By the age of 18 months or so, children should be able to use real objects such as a hair-brush, spoon, or cup, in a way that clearly indicates that they have understood their use. By their second birthday children should be able to do the same thing with miniature toys. The clinician should ask the parent in detail about the way the child plays and what toys he uses. Does he push toy cars in the appropriate fashion or does he just spin the wheels? Does he "talk" into a toy telephone or does he just take it apart? In the clinic the same functions may be assessed by handing the child objects such as a baby's brush and comb, a doll, a mirror, a bed, and

observing what he does with them. Rutter (10a and 10b) refers to Sheridan, who has emphasized the importance of assessing a child's imitative skills and play activities when evaluating language development. She has constructed a "common objects" and "miniature toy" test which are used to determine whether a child comprehends the function of objects and whether he can use them to develop make-believe games. Such play activities probably offer a most useful guide to a child's "inner language" and basic language competence, and hence may provide an item of some predictive value with respect to later language development.

The Danish test (7) to assess "inner language" consists of 20 small toy objects (doll, pillow, doll's clothes, sponge, table, chair, plate, spoon etc.). You put the first ten objects in front of the child and have him play with them, and you write down what the child does with the toys. Does he use them in a way that gives an impression of his understanding of the objects he has in front of him? When the child puts the doll in the bed and puts a pillow behind its head it looks as if he knows what a bed is and what a pillow is made for. He has an "inner language." A child who uses the toys in a correct way knows something about his environment. He is in contact with the world around him.

But how is inner language connected with understanding of a certain vocabulary? Does a child who is playing meaningfully with the toys have a better understanding of language than a child who does not play with the toys in front of him? To answer this question, which is not solved yet, I take all the 20 objects used for the test, put them in front of the child and ask him to take one object at a time, the object I mention. If a high score in "inner language" is connected with a better knowledge of the names of objects the child has been playing with, then the concept of "inner language" is connected with a passive vocabulary. This means that "inner language" can be considered as "real" language: when you know how to play with toys you have a certain vocabulary at your disposal. The "inner language" test is made for children who are the most difficult to get in contact with. The toys give you a good starting point in communicating with the child and thus give you some useful information.

The second subtest is one of "classification." With the first test we try to find out whether the child uses things in a meaningful way and connects them with each other correctly. This second subtest also tries to see how things are put together in a meaningful way, how things are classified. (A similar test is a part of the Leiter International Performance Scale [11]). The

Leiter Scale has a test at the 5-year level with five pictures representing different categories. A picture constitutes the model and the child has to find a similar picture. We also use five different categories of objects or pictures of objects, each category being represented by three different objects or pictures: there are three fruits, three wild animals, three human beings, three kitchen utensils (knife, etc.) and three domestic animals. You take one of each category, for instance the pear, the lion, the soldier, the fork, and the chicken; then you give to the child five representatives of the same categories to see if he can place them with a corresponding item. If the child is not able to do so, you put the five pictures or objects under the first things and you ask the child to put the five objects or pictures which are left under the already-placed objects. I think that here is a possibility of getting some information about concept-formation in nonspeaking children.

The third subtest investigates the child's understanding of sounds. When testing receptive language I find that you should also get an impression of the child's way of identifying sounds. There are two kinds of sounds which the child must understand: nonhuman sounds and human sounds, speech sounds. The first group comprises animal sounds and mechanical sounds. The test here asks the child to listen to different animal sounds from a tape and he has to point to the right picture to show which animal he just heard on the tape (pigs, cows, birds, a dog, and so on). The mechanical sounds come from a telephone bell, a motor cycle, an ambulance, and a drum. Finally, there are three different specimens of music. A child who was very passive during the first part of the test may react to music in some way. Concerning the speech sounds, the child is given a short speech sound discrimination test illustrated with pictures. There are only 10 speech sound oppositions: -r/-rn, br-/pr-, -n-/-l-, sk-/st-, etc. For instance the tape says: "The children have masks. The ship has masts. Show me the masks."

The fourth subtest is a so-called ordinary test of vocabulary, of language understanding, only in my opinion perhaps bigger and more systematically arranged. It starts with nouns. There are 10 categories of nouns each consisting of five nouns. The first five are (a) *knife, cup, plate, spoon, fork*. Then comes (b) *man, house, woman, bed, car*. Then (c) *dog, horse, rabbit*, etc. . . . (h) *metal, wood, glass*, etc. After the first 50 nouns there are 20 nouns that are used to investigate knowledge of parts of the body: *head, mouth, back, arms*, etc. All the nouns are to be found as pictures or as real objects or toy objects. In the next part of the test the child is asked first to take two pictures or objects, for instance, the man and the house; then three

objects, the knife, the cat, and the car; and finally four pictures or objects. This is NOT a memory test. But some authors say that some nonspeaking children may use their first word when asked to work very hard with their memory. The test is made to see if you can make the nonspeaking child say one or more of the words he must remember. The next word class is the verbs. "Are you able to smile, blow, clap your hands, etc. Show me the thing we use for drinking, for eating, we sleep in. . . . Show me an animal who barks, you can ride on, etc." There are 15 verbs, then verbs and nouns combined in sentences: "Touch the chair, put your hand on the table, open the door, etc. Can apples eat, can trees fly, etc.?" There are 20 sentences. Then came adjectives of color: red, blue, yellow, white—12 adjectives, afterwards 23 adjectives designating shapes and other qualities: *round, square, soft, hard, heavy*, etc.

A section on grammar and vocabulary that deals with comparison of size follows: "1. Take a small one. (You have pieces of four different sizes, two of each. . . .) 2. Take several. 3. Take the two smallest. Take one as big as this one." There are sentences with *biggest, almost, bigger, one of the same size* . . . in all 10 sentences.

The numerals follow. First the cardinal numbers: "Point to a card with 2 (or 1 or 5 or 3) banana(s) or elephant(s)." Then the ordinals (a series of 10 identical objects are shown): "Point to the second (the fifth, the first, etc.)"

Then come adverbs, prepositions and conjunctions: "1. Put the knife next to the spoon. 2. Put the chicken in the cup. . . . 7. Point to the fork with the spoon. . . . 25. Take neither the cup, nor the spoon, but the fork." There are 25 sentences of this kind.

The fifth test is designed to examine the child's understanding of oral utterances of increasing length.

Rochford and Williams (12) have made a somewhat comparable test of "comprehension span." It consists of eight pictures and eight sentences. The first sentence has four syllables, the next nine syllables, and the last sentence has more than 70 syllables. The drawback of this test is that even if the sentences may be of a considerable length it is sufficient to look at the picture and just to catch one word or a few words to answer correctly. Picture number five shows a man climbing a mountain. He wears a hat. There is another picture of a boy going to jump in the water together with the just-mentioned picture. The corresponding sentence is: "At different times of the year we have different sports. One of these men is climbing a mountain and, as you see, he is warmly dressed to keep out the cold. Draw a circle with

your finger around the man's hat." I think it is enough to cateh the word "hat" and to look at the picture to answer the question. The eight drawings are without color.

For our test, I have made 18 sentences to go with 18 colored drawings. Recently I have changed the 18 sentences of increasing length to two times 18, making a scale A and a scale B, one of them easier than the other. I start with a sentence of five syllables and end with 49 syllables. It is not a test of memory span. You do not have to repeat the sentence, you have to follow the meaning of it, when you hear what is said, and to point correctly to the right place in the picture. The pictures are made so that the child should not be able to just catch one word and then point correctly. For instance, sentence number five is: "Show me the bag where the greengrocer has put two apples." In the picture you can see the greengrocer, his desk, the bag, and two apples on the desk. You have to point to the bag with the apples, not to the two apples you can see.

The sixth subject deals with grammatical structure. The tests of Fraser, Bellugi and Brown (3) and of M. A. Carrow (2) might give you an idea of this kind of testing.

The whole test consists of these six subtests each of which have been used in the same or a similar form by other people and none of which request verbal response. The whole test should not be used for every single testing. The test battery is an offering from which you should take as much as you like for the special test situation you have at the moment. The test is not standardized, but it has been very useful in two investigations. The first investigation concerned language understanding of children from two different kindergartens, the first with children from middle class homes and the second with children from working class homes. Fifteen children between three and five years of age were tested from each kindergarten. There was an obvious difference between the two groups. A typical three-year-old child from the middle class was better than 11/15 of the children from the working class.

The fourth test (of receptive vocabulary) has been used on 27 children from ages 3 to 6 from four different kindergartens. There is an increasing score of vocabulary for every age group (cf. Table 1). The test of receptive vocabulary has also been used for comparing children from a kindergarten class, from a first grade, and from a class for reading-retarded children. The dyslexic children, who were between 7.8–9 years, had lower scorings than the children from the kindergarten class, who were between 6.8–7.3 years (cf. Table 2).

27 children from four different kindergartens

Age	Number	Nouns	Body parts	Colors	Adject.	Comparis.	Cardin.	Ordin.	Adv. Prep.
3	9	34.6	16.4	5	8.8	2.5	1.6	0.3	11.7
4	5	39.5	17.7	7.4	14.4	5.3	2.9	0.5	18.3
5	6	42.3	18.0	10.3	16.7	8.3	3.7	3.3	20
6	7	46.7	19.1	11.6	20.5	9.6	8.4	6.0	22

Table 1

Test of Auditory Memory Span

I now will turn to another test, but one that can be used only with children who are able to speak. It is a test for auditory memory of sentences, whose purpose, in my opinion, is to assess understanding of language. Elizabeth Carrow (13) says that "sentence imitation has been found to be a fruitful source of information relative to the development of language comprehension

	Age	Number	Nouns	Parts of the body	Colors	Adjectiv.	Compar.	Cardin.	Ordinal numbers	Adverbs Prepos.
K	6.8–7.3	10	45.6	19.2	10.5	20.2	9.7	8.2	6.4	22.3
1.gr	7.7–8.4	10	47	19.2	10.9	21.2	9.7	10	8.8	23.4
Dysl.	7.8–9.0	6	41.7	18.5	9.2	18.7	6.8	7.7	3.8	21

Table 2

and expression in children," and she refers to Menyuk, McNeill, and Lenneberg. Carrow also refers to Ervin who indicated that the grammar of a child's spontaneous speech and the grammar of his imitations of adult utterances are not different. Children reproduce a sentence using the rules they know. If a sentence is within the capacity of a child's short-term memory the child will be able to imitate perfectly ungrammatical and anomalous sentences. The anomalous sentence is handled the same as digits or meaningless syllables. Imitation of structured sentences reveals aspects of the child's concept of syntax only if the stimuli are chosen to put stress on immediate memory. That is the case when the sentences are longer than the child's short-term memory for digits or meaningless syllables.

Carrow's test consists of 51 sentences that range in length from two to 10 words, with an average of six words. The test is administered by recording on audiotape the child's imitations of the stimulus sentences of the examiner. Roger Brown (14) uses length of utterance to assess language in children, that is both the mean length and the upper boundary or longest utterance. The mean length of utterance (MLU) is an excellent simple index of grammatical development, according to Brown, because almost every new kind of knowledge increases the length: the number of semantic roles expressed in a sentence, the addition of obligatory morphemes, coding modulations of meaning, the addition of negative forms and auxiliaries used in interrogative and negative modalities. By the time the child reaches Stage V, however, he is able to make constructions of such great variety that what he happens to say and the MLU of a sample begin to depend more on the character of the interaction than on what the child knows, and so the index loses its value as an indicator of grammatical knowledge. But the MLU is a good simple index of development from about one to about four years of age.

The original stages were points on an MLU distribution (14, p. 58), but in Roger Brown's work of 1973 they have become intervals. Stage I, for instance, begins as soon as the MLU rises above 1.00, when multi-word utterances begin, and ends at 2.00. R. Brown (14, p. 57) gives the mean length of utterance in morphemes for three children starting when they are 18 months old up to the age of 48 months. At stage I the MLU is 1.75; at stage II, 2.25; at stage III, 2.75; at stage IV, 3.50; and at stage V, 4.00. The last stage should be reached at the age of four years.

The MLU is taken from spontaneous speech, whereas Carrow uses elicited imitations. These imitations, however, are not longer than sentences of 10 words, but elicited imitations of longer sentences are used in different

intelligence tests. In the Terman-Merill test for measuring intelligence, the edition of 1937 and the revised edition of 1960, there are age norms for sentence repetition at different ages. The longest sentence used is a sentence of 19 words and 29 syllables. Imitation of sentences is used in measuring verbal intelligence. Verbal intelligence—the ability to master language—is the ability to use grammar, vocabulary, and idiomatic expressions. The scoring on a sentence test is done when the tested person is able correctly to repeat a sentence; the longer the sentence he is able to repeat the higher the score.

For testing language-delayed children you have to start with very easy sentences, that is, sentences of two syllables. It is not sufficient to have one sentence of each length. You must have more. The purpose is to level out the personal differences between the vocabularies of different persons. Two people may possess the same number of words and expressions but each of the two knows different words. One sentence may be easier for one person than for another.

In a test I have developed (15), I use five sentences increasing in length from two syllables up to 41 syllables for adults. It is a question whether you should use words or syllables to measure sentence length. I prefer syllables. One syllable can add a new meaning to a word (house, houses). But certainly you will have to check every group of five sentences to make sure that the difficulty of the sentences is truly increasing with the increasing number of syllables. I developed this test when I was in charge of a group of language-delayed children for many years. I always used this test together with a phonological test.

Between the years 1952 and 1962 I tested 69 language-delayed children between 6 and 12 years with a test for auditory memory span and with a phonological test. The 69 children were divided in three groups of 23. The children with the lowest score on the auditory memory span test had the lowest score on the phonological test. The group with the mean score on the auditory memory span test had the mean score on the phonological test and the group with the best score on the auditory memory span test had the best score on the phonological test. How can you explain that? I think that the ability to repeat sentences shows the ability to understand the meaning of the sentences, the content of the language, whereas the ability to use the correct phonemes of the language at the right places in the words shows the ability to master the form of the language, that is the "box" in which you put the content of the language. You cannot have a meaning, an idea, without giving it a form, an outward manifestation. Children who had very little language

were able to repeat only sentences of a length which corresponded to their memory span of digits. But when language became more meaningful the ability to repeat sentences increased. The more you understand of language, the longer the sentences you are able to repeat.

This seems to be the case with language-retarded children, but it also seems to be the case with normal children learning a foreign language. I tested 25 Danish children who were learning English in a 7th grade school in Aarhus, Jutland, with an English auditory memory s[illegible]n test (Fig. 1). The teacher was asked to give me the standard of Eng..sh for every pupil. I compared the children's scoring on the sentence test and the teacher's evaluation of each child's standard in English (Fig. 2). There was a high correlation between the two ways of evaluating these children's proficiency in English.

The teacher evaluated the ability of the pupils in English according to a 7-step evaluation scale and I also had to use a 7-step scale for my scorings. I found that eight pupils got the same position with both kinds of evaluation. Twelve pupils showed a difference of one step and five pupils showed a difference of two steps. There is a correlation of 0.73 between the two ways of evaluation. The same test was used with eleven pupils in a high school class in Aarhus. The teacher evaluated the pupils according to a 4-step scale and I also used four degrees of sentence span. Five pupils had the same evaluation with the sentence span test and with the teacher's evaluation, five pupils had a difference of one step and only one pupil had a difference of two steps. I also tested the same 7th grade with a Danish sentence span test and compared the scoring with the scoring on a special Danish language test given to the class by the teacher. Twenty-four pupils were tested. The teacher made an evaluation of a five step scale. I found that 21 pupils had the same position or a difference of one step between the two ways of evaluation, two pupils had a difference of two steps, and one pupil a difference of three steps.

A Danish psychologist, H. Meyer, working with digit-span testing thought that he would have the best differentiation between the scores (1) if he gave a correctly repeated sequence of digits the score of the square of the length of the sequence (a correctly repeated sequence of 2 digits gave a score of 4 points, and a correctly repeated sequence of three digits gave a score of 9 points), and (2) if all the scores for every correctly repeated sequence were added in one main score. You could call the way of scoring "the total score method." With the sentences I use the total score method, but I give only one point (not the square) for every correctly repeated sentence.

English-Auditory Memory Span Test

2 to 41 syllables.

Scoring: The sentences have to be repeated without errors, which comprise omissions, substitutions, additions and changes in order of words.

Sentences of 2 syllables of 4 points (1 point) each	Square p.	Ad. p.
All sentences of 2 syllables (5 x 4)(5 x 1)	20 p.	5 p.

1. I can
2. you must
3. good bye
4. Is he ?
5. Are you ?

Sentences of 3 syll. of 9 points (1 point) each	Sq. p.	Ad. p.
All sentences of 3 syll. (5 x 9)(5 x 1)	45 p.	5 p.
- - of 3 - + preceding sentences	65 p.	10 p.

1. Good morning
2. I am glad
3. You are young
4. How is he ?
5. Can you hop ?

Sentences of 4 syll. of 16 points (1 point) each	Sq. p.	Ad. p.
All sent. of 4 syll. (5 x 16)(5 x 1)	80 p.	5 p.
- - of 4 syll. + preceding sentences	145 p.	15 p.

1. The man is old
2. You have a dog
3. He has no hat
4. Are you hungry ?
5. Is this your car ?

Sentences of 5 syll. of 25 points (1 point) each	Sq. p.	Ad. p.
All sent. of 5 syll. (5 x 25)(5 x 1)	125 p.	5 p.
- - of 5 syll. + preceding sentences	270 p.	20 p.

1. I shook hands with him
2. I knew it was her
3. There are only six
4. Where did she come from ?
5. Can I speak to him ?

Figure 1

Number of sentences correctly repeated	Pupils' registration number	Correspondence between pupils' standard in English according to sentence span (left) and to teacher's evaluation(right)	Pupils' registration number	Teacher's evaluation
14	14		14	3
29 - 32	4 10 13 12		10	6
37 - 40	11 18 24		1 13 11 24 12	7
43 - 45	7 9 23 22		4 9 6 20 22 8 23	8
46 - 49	1 15 5 19 6		7 16 18 17	9
50 - 53	8 20 16 21 17 25		2 15 3 19 5 25	10
55 - 61	2 3		21	11

Difference between teacher's evaluation and scoring on the Auditory Memory Span Test for sentences:
0 step .—. :8. 1 step .—: :12 . 2 steps .—: :5 .

Figure 2

The auditory memory span test for sentences gives a concentrated impression of a person's ability in language understanding. To repeat sentences correctly you must be familiar not only with the grammar of the sentence but also with the vocabulary and the idiomatic expressions.

A Standardized Phonological Test

For many years we have used a word repetition test in Aarhus to describe the phonological standard of a language-delayed child. The test, however, was not standardized, and we did not know how many words a normal child was able to repeat correctly of the 200 words in the test. Since almost all language-retarded children were examined with this test, a group of speech therapists in Odense and I decided to make a standardized phonological test which could replace the just-mentioned Aarhus test. We wanted to take everything of importance for test construction into consideration.

How many phonological items (vowels, consonants and consonant clusters) should we have in the test? We arranged meetings with phoneticians and linguists from the Universities of Aarhus and Copenhagen and with other people who might be able to tell us something about this question. We got further information that the items should be put into words, which should be placed at the end of a sentence, and that the sentences should follow each other at random. The children should be tested from a tape and at best each tape should be different.

We arranged the testing so that for each child the testing started one item later than with the testing of the previous child, in order to eliminate the problem of having some items at the end of the test when the child was tired. We arranged a pilot testing of 200 kindergarten children between six and seven years. We also had some meetings to check inter-tester correlation. We used a video tape and from the answers of a child being tested we each wrote down what we had heard the child say. We were able to reduce considerably the differences among the testers.

We wanted to test 1000 children between 3 and 8 years old, 100 (50 boys and 50 girls) for every half year. To be sure to have this many we got the permission to have 1500 random addresses of children from the census paper of the town of Odense. We got the names of every 19th child of the ages we wanted from the county of Funen. Before testing the child the parents were asked about some of the child's habits and surroundings: Did the child look much at television? How many brothers and sisters did he

have? Did the parents speak much with him? And so on. About 1200 children, half of them girls and half boys, were tested. We decided that a child had mastered an item if he was able to repeat it correctly after having heard it from the tape. If 70 percent of one age group was able to repeat an item we considered it learned for this age group. No item was learned by 70 percent of the children from 3 to 3½ years of age. But from 3½ to 4 years 33 items were learned, from 4 to 4½ years 31 new items were added, from 4½ to 5 years 30 new items were learned, and from 5 to 5½ there were 21 new items. After that time very few items were added. From 5½ to 6 only 3 new items were registered; from 6 to 6½, five items; from 6½ to 7, four items; and from 7 to 7½, three items. No new item was added between 7½ and 8 years. After eight there still were 8 items which had to be mastered but we were unable to tell when that happened. This shows us that Danish children learn the most important phonological units before they are 5½ years old.

Now we know what we can expect from language-retarded children, and the research we did at Odense has saved a lot of money for the Danish state, because we can stop treatment earlier than before, knowing that even an eight-year-old normal child has something to learn.

The scoring sheet has 138 items. The pages have nine vertical columns (see Fig.3) with room for nine phonetic categories and nine age groups. The categories are: (1) vowels + *r* and diphthongs; (2) initial consonants; (3) final consonants; (4) initial consonant clusters of two consonants, the first being an *s*; (5) initial consonant clusters without *s*; (6) initial consonant clusters of three consonants; (7) final consonant clusters with an *s*; (8) final consonant clusters without an *s*; and (9) final consonant clusters of three consonants. To the left of every line you find the sentence recorded on the tape with the phonological item incorporated. The phonological item is placed in one of the nine categories. At the bottom of the page you find the nine age groups. Most of the lines have hatchings which stop in front of the age group where 70 percent of the children from this group has learned the item. When you test a child you are able to register the kind of item the child can master and you can see at the same time at what age this special item should be learned (Fig. 3).

In this connection I want to mention that Arlt and Goodban (16) have made a similar kind of investigation on 240 normal children from ages three to six. The test had 79 sound elements, which were incorporated in a list of 48 words.

175

Figure 3

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Kun til logopædisk brug

SITO-TESTEN
FONOLOGISK TEST
STANDARDISERET 1973 SITO.

First page of Danish phonological test. 138 items.

Aldersnormerne aflæses i det hvide felt længst til venstre på hver linie. (Age norms in the first white field to the left).

Navn:		Testdato	År	Md.	Dag
J. nr.:	CPR.	Fødselsdato			
Tester:		Testalder			

nr.		Vokal-område Vok. + r Diftong	Enkeltkonsonant		Konsonantgrupper					
					Forlyd			Udlyd		
			Forlyd	Indlyd Udlyd	2-kons. grp.		3-kons. grp.	2-kons. grp.		3-kons. grp.
					s-grp.	øvr. grp.		s-grp.	øvr. grp.	
1.	Det er papir	IR								
2.	Der er fjernsyn					FJ-				
3.	Det er en bænk								-NGK	
4.	Der er plads					PL-				
5.	Det er trommer					TR-				
6.	Det er et værft									-RFT
7.	Han fik et puf			-F						
8.	Det er en vægt								-GT	
9.	Det er en vækst									-GST
10.	Det er godt		G-							
11.	Det er spande				SB-					
12.	Han hedder Frits							-DS		
13.	Det er en dør	ÖR								
14.	De er tvillinger					TV-				
15.	Det er halm								-LM	
16.	Det er biler		B-							
17.	Han er skyattet						SGV-			
18.	Det er en hals							-LS		
19.	Det er vand		V-							
20.	Han er kvik					KV-				
21.	Hun er skælmsk									-LMSK
22.	Det er en kop			-P						
23.	Han er sjov				SJ-					
24.	Det er en dans							-NS		
25.	Det er Tage		T-							
26.	Den er skarp								-RP	
27.	Den løber lobsk									-BSK
28.	Han hedder Peter		P-							
29.	Det er skruer						SGR-			
30.	Det er tungt								-NGT	
31.	Det er et bær	ÆR								
	Aldersgrupper:	3½—4	4—4½	4½—5	5—5½	5½—6	6—6½	6½—7	7—7½	Efter 8

Final Remarks

For dyslexic children all three tests should be useful. The first test of language understanding has shown that dyslexic children have a lower score on this test, indicating that they have a reduced understanding of language. The auditory memory span test is also a test of language understanding, of language proficiency, and according to testings I have made, dyslexic children have a reduced score on this test also. Concerning the phonological test we have shown that eight-year-old children still do not master eight items. It should be expected that dyslexic children have a lower score than normals on this test, as there seems to be a connection between scoring on an auditory memory span test and phonological scoring. These tests seem to have both diagnostic and predictive value.

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Dyslexia as a Limitation in the Ability to Process Information

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Abstract

In an earlier paper (Miles and Wheeler 1975) it was reported that dyslexic subjects, aged over 13, were less able than suitably matched non-dyslexic subjects to respond correctly to arrays of tachistoscopically presented digits. A further experiment is now reported involving a younger age-group: 15 dyslexic subjects, average age twelve and one-half, were matched for spelling age with 15 non-dyslexic subjects, average age eight and one-half; and since the dyslexic subjects were appreciably less successful it is argued that "maturational lag" does not, on its own, fully account for the difference in performance between the two groups. A similar procedure was repeated with 41 dyslexic and 41 non-dyslexic subjects, all aged between 10.4 and 14.4, both with and without the introduction of a visual masking stimulus immediately after the test stimulus. Twenty undergraduate "fast-readers," 20 undergraduate "slow-readers," and four undergraduate dyslexic subjects were also compared both on their responses to tachistoscopically presented digits and on their performance in a visual search task. The results, taken in conjunction, suggest that dyslexia can be regarded as some kind of limitation in the ability to process information, perhaps affecting in particular the "visual code store" postulated by Posner et al. (1969).

Foreword

We should like to preface this paper by paying tribute to the pioneer work of S. T. Orton. It is a great privilege to have the opportunity of addressing members of the society named after him, and our only regret is that it has not been possible to deliver this paper in person.

This paper was prepared for delivery *in absentia* at the 27th Annual Conference of The Orton Society, in New York City, November 1976.

Acknowledgement. We are grateful to the Social Science Research Council for its financial support during the early stages of this research.

Introduction

At Bangor, Wales, our research into dyslexia started with informal observation. In particular we studied the mistakes made by children and adults in repeating digits (as in the Wechsler intelligence tests), in reciting arithmetical tables, in saying the months of the year, and in a variety of other tasks. (For further details see Miles 1975). A recognizable pattern of difficulties, often occurring in several members of the same family and inexplicable in terms of lack of intelligence or opportunity, led us to the concept of a constitutionally caused limitation; and it became plain that the difficulties were basically similar to those described by Hinshelwood (1900 and 1917), Orton (1937), Hermann (1959), Critchley (1970), and many others. In what follows, those displaying such difficulties will be described as "dyslexic," those not displaying them as "nondyslexic." We question the use of the question-begging word "normal"; and although all the subjects whom we shall designate as "dyslexic" were in fact weaker at reading and spelling than might have been expected in view of their intellectual level it is not this fact in isolation which justifies the use of the word "dyslexic" but the pattern formed by their difficulties taken in conjunction. The choice of a word implying a constitutional cause is, of course, intentional.

In a first attempt to make sense of our findings one of the present authors made the suggestion that the main feature in dyslexia was "an inability to retain complex information over time" (Miles and Wheeler 1974, p. 9). Since then we have attempted to study the behavior of dyslexic and nondyslexic subjects in more rigorously controlled conditions, with a view to finding out, first, whether the alleged differences genuinely occurred when the conditions were adequately controlled, and, secondly, what in that case were the tasks or combinations of tasks which presented the dyslexic subjects with special difficulty. In general our policy has been to vary the kind and amount of stimulus material presented, the duration of time for which it is available, and the interval between its presentation and the time at which the subject is required to respond.

Background Research

One of our earliest procedures was to use digits as stimulus material and to present them tachistoscopically at varying time-intervals. An initial experiment along these lines was summarized at the Orton Society meeting at

80

Rochester, Minnesota, in 1974. (For further details see Miles and Wheeler 1975.) In this experiment the performance of 11 dyslexic subjects, all over the age of 13, was compared with that of 11 nondyslexic subjects of similar age. The differences were staggering: when 5 or 6 digits were presented on the cards the nondyslexic subjects were able most of the time to produce the right answer at exposure times of less than 350 milliseconds (ms.), whereas the dyslexic subjects (who included two undergraduates and several others of university caliber) needed 750 ms. or more. This finding is in line with that reported by Stanley and Hall (1973) who presented six-letter arrays to dyslexic and nondyslexic children for durations of 40–6000 ms. and found that at the higher exposure times the nondyslexic children produced superior recall. More recently Davis (1975), using exposure times of 40 ms. to 6 sec. and with both letters and pictures as stimulus material, has reported a similar difference. These findings, taken in conjunction, seemed to us sufficiently interesting to merit follow-up in further detail.

Two other investigations have encouraged us to look in the general area of "immediate memory" for an increased understanding of dyslexic type difficulties. First, in a study reported by Harzem, Lee, and Miles (1975), 10 dyslexic children aged 9 to 13, and 10 nondyslexic children aged 6 to 7, were required to spell single words by selecting the appropriate letters from an array. Each letter, as it was selected, was either left in front of the subject or moved out of sight; the words to be spelled were presented either visually or aurally, in each case for 10 sec., and the subject responded either immediately or after a delay of 60 sec. during which he sat silently. For the nondyslexic subjects the delay resulted in more spelling errors only in the visual presentation/letters-removed condition; for the dyslexic subjects the delay resulted in more spelling errors (i) in the aural presentation/letters-removed condition, (ii) in the visual-presentation/letters-present condition, and (iii) in the visual-presentation/letters-removed condition; it failed to do so only in the aural-presentation/letters-present condition. Secondly, Blackburn (1976) has used the Bangor files to examine retrospectively the performance of 94 dyslexic subjects (age range 7.6 to 19.9) on the Wechsler "digits forward" and "digits reversed" tests. The Terman and Wechsler norms imply that in the case of nondyslexic subjects—as might be expected—there is improvement with age. Blackburn found, however, that on "digits reversed" the older dyslexic subjects were obtaining only marginally higher scores than the younger ones, and that on "digits forward" the correlation between age and higher score was virtually non-existent. These findings and those of Harzem, Lee, and

Miles (1975) both support the view that dyslexia involves some kind of limitation of immediate memory, though the nature of this limitation is by no means clear.

In what follows we shall describe five further experiments, not in full detail (though further details are available on request) but as an interim report which indicates the areas at present being investigated and our provisional conclusions.

Some Experimental Findings

The original experiment involving tachistoscopic presentation of digits (Miles and Wheeler 1975) had involved subjects over the age of 13. It therefore seemed desirable to check whether similar differences were still found when the subjects were children. At the same time we wished to take the opportunity of investigating the "maturational lag" hypothesis of dyslexia; in other words, were the mistakes made by dyslexic subjects simply an indication of late development of certain skills or should one think in terms of some inherent defect or specific limitation? We therefore decided to match our dyslexic and nondyslexic subjects not for chronological age but for spelling age. If both groups performed at the same level on the "tachistoscopic presentation of digits" task this would be evidence for maturational lag, whereas if the dyslexic subjects performed less efficiently than the control subjects this would support the hypothesis of some specific limitation.

Experiment 1. Fifteen dyslexic subjects (average age 12) and 15 nondyslexic subjects (average age 8.5), suitably matched for spelling age, were presented tachistoscopically with cards containing 4, 5, 6, or 7 digits, with exposure-times between 400 and 1600 ms. When the cards contained 4 digits (with 3 presentations per subject at 400 ms. and 1 presentation per subject at 800 ms.) 6 errors occurred in the 120 cards presented to both groups, all of them being made by the dyslexic subjects. When the cards contained 5, 6, or 7 digits (again with 3 presentations per subject in each condition), the results were as shown in Table 1. These results not only provide additional evidence that dyslexic subjects are distinctively weak at this kind of task; they also suggest that an explanation of dyslexic-type difficulties solely in terms of "maturational lag" is inadequate.

Experiment 2. In this experiment, exposure-times between 50 and 1200 ms. were used and each card contained seven digits. The subjects were

Table 1. Mean Number of Digits Correctly Recalled

No. Digits per Card	*Exposure Times*	*Dyslexic Subjects*	*Nondyslexic Subjects*
5 digits	400 ms.	3.44	4.37
5 digits	800 ms.	3.95	4.87
6 digits	400 ms.	3.88	4.97
6 digits	800 ms.	3.94	5.24
6 digits	1200 ms.	4.18	5.65
7 digits	400 ms.	3.64	5.00
7 digits	1600 ms.	4.64	6.27

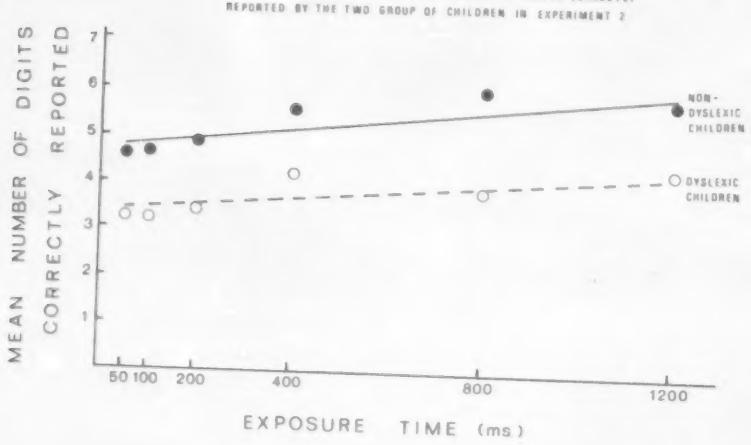
children between ages 10.4 and 14.4 years, with 41 being dyslexic and 41 nondyslexic. Figure 1 gives the results when numbers of digits correctly recalled are plotted against exposure time. The difference between dyslexic subjects and nondyslexic subjects is thus confirmed again; and the graph shows some other interesting features which we shall discuss below.

Sperling (1963) and others have shown convincingly that stimulus information can be "available" in the brain (in what is called the "iconic store") for a short period after the initial source of stimulation has ceased to operate. This period is probably of the order of 100–200 ms. (See Neisser 1967). It follows that in Experiments 1 and 2 the effective exposure time—i.e., the total time available to the subject for processing information—must have involved a combination of tachistoscopic exposure time *plus* iconic storage time. If, however, a visual masking stimulus is added immediately upon the offset of the test stimulus, this will have the effect of introducing "noise" into the iconic store and prevent the further processing of information; and in that case effective exposure time and tachistoscopic exposure time can be equated. (For further theoretical discussion of masking see Kahneman 1968.)

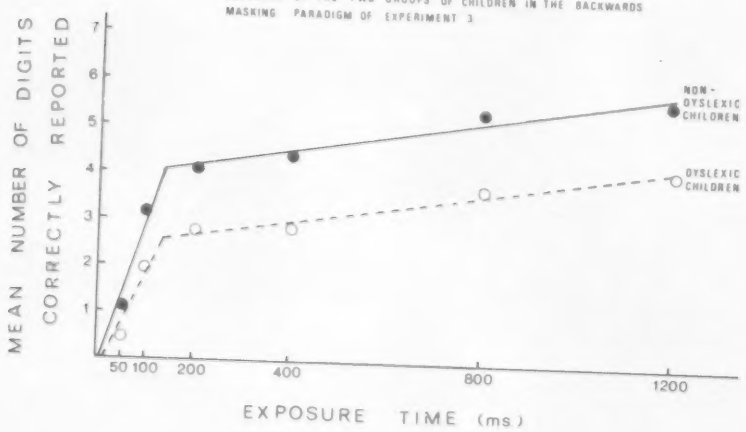
Experiment 3. This involved the same subjects and the same procedure as in Experiment 2 except that a visual masking stimulus, in the form of a complex of meaningless shapes, was introduced for 200 ms. immediately after offset of the test stimulus.

Figure 2 gives the results when number of digits correctly recalled is plotted against exposure time.

EFFECT OF EXPOSURE DURATION ON NUMBER OF DIGITS CORRECTLY REPORTED BY THE TWO GROUP OF CHILDREN IN EXPERIMENT 2



EFFECT OF EXPOSURE DURATION ON NUMBER OF DIGITS CORRECTLY REPORTED BY THE TWO GROUPS OF CHILDREN IN THE BACKWARDS MASKING PARADIGM OF EXPERIMENT 3



We shall compare below the data of Figure 2 with those of Fig. 1.

Our next task was to follow up our earlier idea (Miles and Wheeler 1974) that the difficulties experienced by dyslexic children and adults in reading, spelling, and arithmetic were manifestations of a more general difficulty, which we now decided to characterise as "slowness in processing information." We therefore conducted an experiment with undergraduates aimed at finding out whether those who were slow at reading were also slower at other tasks which involved information processing. In order to obtain an accurate measure of "digit-processing time" a visual masking stimulus was again introduced.

Experiment 4. Cards containing five digits were presented tachistoscopically to 44 undergraduate subjects. By means of a suitable ranging method it was possible to calculate for each subject the minimum time needed for correct reproduction of the 5 digits. On the basis of suitable reading-speed tests the subjects were classified as either "fast readers" (20 subjects) or "slow readers" (20 subjects); and 4 undergraduate subjects known to be dyslexic also took part in the experiment.

Experiment 4a. These subjects carried out a visual search task in a further experiment similar to those described by Neisser (1963, 1967), in which they were required to search for target digrams among passages of nonsense letters. Results for Experiments 4 and 4a are given in Table 2.

Table 2. Five-Digit Processing Time and Digram Search Time

	Average Reading Speed for 5 Passages (words per minute)	*5 Digit Processing Time (ms.)*	*Total Digram Search Time (sec.)*
Fast readers (N = 20)	$\bar{x}$ 305.1 s.d. 59.8	$\bar{x}$ 114.1 s.d. 57.0	$\bar{x}$ 167.3 s.d. 21.8
Slow readers (N = 20)	$\bar{x}$ 181.1 s.d. 25.6	$\bar{x}$ 219.5 s.d. 191.1	$\bar{x}$ 188.4 s.d. 30.3
Dyslexic subjects (N = 4)	$\bar{x}$ 123.8 s.d. 39.9	$\bar{x}$ 450.0 s.d. 100.0	$\bar{x}$ 250.5 s.d. 15.8

Experiment 5. The procedure of Experiment 4 was repeated on the 82 subjects of Experiment 2 (children aged between 10.4 and 14.4, of whom 41 were dyslexic).

It will be noted that the dyslexic children took over four times as long as the control children to process the five-digit test stimuli and that the undergraduate dyslexic adults needed more time than the nondyslexic children.

Discussion

The evidence put forward above, taken in conjunction with the earlier evidence, both our own and from elsewhere, seems to us to establish that dyslexic subjects are distinctively weak at responding to tachistoscopically presented digits. This claim has "held up" in a variety of different conditions.

In addition, Tables 2 and 3 give some provisional support to the ideas that reading can be regarded as a special case of information processing and that it may be feasible to obtain a stable processing rate for each individual over a limited period. We do not doubt that over the long term the processing rate can be improved (and this has been partially confirmed by informal observations on nondyslexic adult illiterates); but it is interesting that the four dyslexic undergraduates, though their processing time was far faster than that of the dyslexic children, were still taking longer than the nondyslexic children despite the fact that over the years they must have been exposed to far more printed material. It is therefore reasonable to suggest that dyslexia involves some special kind of limitation in the ability to process information, a limitation which can be partly but not fully overcome by suitable practice and training.

Table 3. Five-Digit Processing Time for Subjects between 10.4 and 14.4 Years of Age

	5 Digit Processing Time (ms.)
Dyslexic children	$\bar{x}$ 1331
(N = 41)	s.d. 585
Nondyslexic children	$\bar{x}$ 289
(N = 41)	s.d. 156

Many problems remain, of course, as to what kind of limitation it is; but in the light of the above findings we should like to make one further suggestion.

If we compare Figure 2 with Figure 1, an important difference is that the former shows a "two-limber" function similar to that which is typically reported in comparable masking situations (Sperling 1963, 1967; Merickle et al. 1971; Coltheart 1972; Henderson 1972). Various models have been proposed by these authors to explain the presence of the two "limbs"; and possibly it is right to think in terms of two different storage systems which supplement each other—one of these, corresponding to the first "limb," a "visual code store" to which visual material can immediately be transferred (see Posner et al. 1969; Posner 1973), and the other, represented by the second "limb," a name code store where visual and auditory information can be combined. If this is right, then our results suggest that it is the former that functions less effectively in dyslexic subjects. It will be noted that in Figure 2 the slope of the second "limb" is the same for both dyslexic and nondyslexic subjects, the two functions being respectively:

$$\text{dyslexic subjects}—y = 2.38 + 0.0015\,x$$
$$\text{nondyslexic subjects}—y = 3.91 + 0.0015\,x$$

It is possible, therefore, that the differences between the two groups of subjects arise not because of any difficulty on the part of dyslexic subjects in producing the correct names for items in the stimulus array but because of a limitation, which shows itself during the first 150 ms. of processing time, in visual code capacity. While nondyslexic subjects can improve their visual code capacity with practice, it appears that dyslexic subjects even over a period of years fail to show an improvement which is at all comparable.

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Orton-Gillingham Methodology: Where Have All of the Researchers Gone?

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Every discipline grows and develops through research, and where there is a lack of research the discipline is stunted. As the Orton Society grows and the influence of our ideas spreads throughout the world, we are confronted and challenged by doubters as well as by seekers. Despite the exemplary precedent established for us by the years of careful research done by Dr. Samuel Orton, we have been all too content to languish in the by-products of his labors. It is not enough to advocate and to practice the methodology based upon the research and labors of Dr. Samuel Orton and Anna Gillingham. If we are to justify our existence, if we are to avoid the criticism already being voiced—"where is your proof that this method works?"—we must become involved in meaningful research. It is a vital necessity to our survival.

Aside from the well-known follow-up study done by Margaret Rawson[1], the studies by Monroe[2], and studies by the Klines[3,4,5,6] there is little carefully conducted research on Orton methodology in terms of results obtained. In her State of the Arts paper[7] at the World Congress on Dyslexia in 1974, Margaret Rawson was unable to find many statistically treated facts (as contrasted with case studies and subjective evaluations) to substantiate the belief that we have an effective method for helping children with developmental dyslexia. Why is so little research being done and recorded by our members? I would like to explore this question in this brief paper, hoping to inspire an upsurge in research activity.

Behind all that there is the basic premise that the undertaking of research is a serious, time-consuming and energy-sapping business that requires concen-

This paper was presented to the International Symposium on Language Disabilities, 27th Annual National Conference of The Orton Society, in New York City, November 1976.

trated attention, technical knowledge, and competence. In a sense it requires as much dedication, insight, ability and experience as does carrying out intensive psychotherapy. E. J. Anthony[8] points out that research should be built into our daily clinical experiences and quotes a motto once proclaimed at the Tavistock Clinic in London: "No therapy without research and no research without therapy."

Who Can Do Research?

It seems safe to assume that anyone involved in special work with children and adolescents is a potential researcher. There is probably a latent impulse to investigate lying in all of us, just waiting to be catalyzed into action. It is easy to rationalize *not* doing research, but there is really no worthwhile excuse for the potential researcher not to *do* research. One need not be discouraged by the *internal* and *external* obstacles awaiting those who set out to explore.

Many are discouraged from entering the research field by the stereotype in the minds of many clinicians about investigative studies. They often see investigators as cold, hard, mechanistic, tough, and computer-oriented, in contrast to the clinician who is seen as humane. Bachrach[9] attempted to explode some of this mythology, pointing out that people simply do not do investigations in the way that people who write books about research say that they do! Another factor discouraging many from involvement in research is that it is frequently equated with formal statistics and the mystique of the huge computers grinding out their complex analyses of data.

Piaget is generally recognized as one of the world's greatest living researchers. Yet a good many of his investigations simply involved careful observation of individual children together with well-organized recording of what he observed. As Anthony[9] has pointed out, "the research world is, therefore, not a bureaucratic world of in-trays and out-trays, and of time schedules and precisely anticipated aims and objects, although proposals for research grants are expected to give this impression."

It is well to recognize that the research mind is often *confused* and *uncertain*. At the same time it is flexible, open, and prepared to be deflected by an unexpected finding. The route from question to answer can be a circuitous one. The research worker must be on guard against his or her own built-in prejudices and assumptions. People tend to perceive what they have been

98

taught to perceive, or trained to perceive, or what they expect to perceive; there is a distinct tendency to fail to perceive facts which are opposed to one's own predilections and suppositions.

Piaget said: "When the psychiatrist is confronted clinically with a learning disability, he should not content himself merely with the signs and symptoms or with measures of intelligence and emotionality; what he must discover is the level at which the *cognitive process* has foundered and must therefore examine the patient as to his stage of operational thinking (logical, arithmetical, spatial, temporal, causal, etc.) and integrate these data with others derived from the more clinical inquiry." This, to me, expresses the importance of the combined clinical research effort which should be part of our daily work.

The Child as a Research Subject

Ethical Problems: Children must never be exploited or manipulated in the service of research. The fundamental developmental needs of the child should always take precedence over the importance of a research project. Confidentiality of research documents must be closely guarded. Consideration for the needs of children is well summarized by Anna in Margaret Landon's well-known book *Anna and the King of Siam* where she says, "Understanding children and conducting research on them is largely a matter of getting to know them, getting to like them, when you are with them getting to know what to say, seeing it their way as well as putting it your way, but nicely."

Data derived from working with children may not be valid if the child and the researcher are not communicating well with each other. Research should be done "nicely."

In order to understand the behavior of a child in a particular research context, we should remember the following, quoted from Lewin[10]:

1. There is a distinction between the situation as constructed and perceived by the researcher and the situation as experienced by the child. The researcher needs to know something of the child's life-space experiences, such as fears, affections, aspirations, dreams and realities as they are interpolated into the experimental situation.

2. These psychosocial aspects are as essential to the researcher's understanding of the situation as the physical factors involved in the setting.

3. The atmosphere generated reciprocally by the researcher and his subject may sometimes contain too much tension, suspicion, fearfulness, and antagonism for the research process to work at all.

In addition to having good perspective on the child in a particular research context, some basic considerations about the child as a person are important:

1. The child is a growing, differentiating organism who becomes increasingly complex with each step in development.

2. He is an organized whole who functions as such within every situation in which he is placed. Since neither the child nor his behaviour can be broken up and reassembled in the literal sense, difficulties arise in scientific child study.

3. He lives in a context that is neither simple nor unitary and that continuously affects his behaviour and development. He perceives the environment in certain ways and selects parts to which he responds.

4. He is engaged in a continuous process of development that is not reversible, and therefore he does not step into the same research stream twice.

In addition to all of these factors there are what Anthony has referred to as the "psychopathology of everyday research." The time of day, the time of year, the state of his bowels, the time of his last meal, or an upper respiratory infection may intrude upon the child's level of performance at a given time. If he is tired, hungry, or bored his research behaviour can deteriorate into stubborn silence. He may clown, play the fool, "romance," or guess with little concern for his responsibility as a subject.

Research and Orton-Gillingham Methodology

Having highlighted some basic ideas about research with children, it is time to attempt an analysis of the dearth of research reports on Orton-Gillingham methodology. All who have learned the methodology and who have applied it effectively know that the results are good. The few in-depth research reports in the literature testify to this fact. Why isn't there more "before and after" research? It seems to me that several factors operate, in addition to those mentioned before:

1. Difficulty in obtaining adequate before and after psycho-educational testing. So often the diagnosis of dyslexia is made on the basis of inadequate evaluation of the child. Obtaining more extensive data is difficult because of

(a) lack of competent testers, (b) disagreement as to what constitutes adequate evaluation, and (c) expense involved in evaluating and re-evaluating.

2. Inadequate facilities or personnel for evaluating the total child, including family and school environment. Many psychiatrists and psychologists have little knowledge or interest in learning disabilities.

3. Educators who are poorly prepared to understand the process of learning to read and who have no knowledge about language disabilities. Such teachers are often hostile and defensive towards efforts being made to help the dyslexic child. "There is no such thing as dyslexia" is a common statement. Such teachers and principals can sabotage efforts to help the child, thus complicating interpretations of research data.

4. Lack of funds to provide for research assistants to compile and process the data. A new book was recently published entitled *Grants: How to Find Out about Them and What to Do Next.** The author, Virginia P. White, has done an outstanding job in providing essential information and guidance about obtaining research grants. Reference to this book will be valuable in planning a search for research funding.

5. Lack of training in how to assemble data and in how to write a scientific paper suitable for publication in a professional journal.

6. Some say they are just too busy helping children with problems and haven't time for research. While each individual should choose his or her own approach to the problem, more careful self-examination of the reason for *non*-involvement in clinical research should be made.

Flournoy once stated two scientific principles approvingly quoted by Piaget (1944)[11] : the first is the Hamlet principle that all things under heaven and on earth are possible, and the second is the Laplace principle that the weight of evidence must be proportional to the strangeness of the facts. These two considerations offer the clinical researcher a lot of leeway in conducting his research, but he is still under obligations to *do* the research and to *report* his findings!

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Interactions between Educational Therapist and Child

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While to outsiders the task of tutoring looks deceptively easy, you and I know that baffling situations arise, that discouragement sets in, that once in a while one has to admit that the job is beyond one.

In this presentation, I have not shied away from truisms but will attempt to conceptualize which are the forces we have to face within ourselves and the child.

In looking through the literature I do not find a satisfactory definition of the remedial teacher's task, what, beyond the necessary formal qualifications and training, makes for success in remediation, which types of youngsters present the most severe challenge, and which are the pitfalls inherent in the job.

The remedial therapist, is, of course, something of an oddity. She is not a psychotherapist but she is not, in the usual sense, a teacher. Unlike the teacher, she works with individual children rather than with groups and unlike the teacher, she does not deal with children who, by and large, have reached a level of development—cognitive, perceptual, linguistic and emotional—that enables them to benefit from the teaching methods offered them in the schoolroom. The educational therapist is concerned with pathology of learning. Children are referred to her because they have failed or have been predicted to fail at school. They constitute a highly selected group.

The remedial teacher's goals are educational and while in the process of learning the child's inner situation may be modified; she is concerned with that part of the child's psychic organization that deals with reality that is to say, with the ego. Her task is to teach the youngster not only specific skills but to delay immediate gratification, to check unruly drives, to enjoy mastery for its own sake rather than for extrinsic rewards, all of it in the framework of the specific learning situation.

In contrast, the psychotherapist works with disturbed youngsters who

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The following three paragraphs were inadvertently omitted from the beginning of Mrs. de Hirsch's article (page 88) when it was published in the 1977 ***Bulletin of the Orton Society***. The editors apologize to the author for this error.

During the 35 years I have worked in the field of remedial education, I have read a great many reports from educational diagnosticians and therapists, reports that run more or less like this: John is repeating the 3rd grade but he is failing in reading comprehension, spelling and composition. His number concepts are adequate. He rates a full scale IQ of 123 on the WISC, scoring high—16—on Similarities and very well—15—on Block Designs but quite low on Digit Span and Coding. His visual discrimination is excellent, at least where non-verbal patterns are concerned. His Bender is acceptable for his age. However, his auditory memory span is short, his auditory discrimination and sequencing are weak. He has trouble formulating and is unable to summarize the plot of a movie he has seen the previous day. He is an agreeable youngster, very anxious to do well but his attention fluctuates. He and his therapist have worked hard on phonics and John has mastered all of the rules. He has learned to blend. Nevertheless, his progress is remarkably slow in spite of the fact that he sees his therapist religiously for three sessions each week.

This is a sound enough report but unfortunately it does not tell me a great deal about John, less about the therapist and nothing about the interaction between the two.

In looking through the literature I do not find a satisfactory definition of the remedial teacher's task—what beyond the necessary formal qualifications and training makes for success in remediation, which types of youngsters present the most severe challenge and which are the pitfalls inherent in the job?

may not be available to learning and who, as a result of conflict, are either fixated on or have regressed to a level of development that does not permit them to give of themselves to educational demands. The psychotherapist directs himself to the child's inner situation, to his unconscious fears, his fantasies, his secret terrors, to those forces that interfere with his investment of psychic energy in tasks unrelated to his drives.

The educational therapist who sees himself as a psychotherapist is bound to fail in both roles. Goals and methods differ. It is unwise to blur the boundaries between the two approaches. Nevertheless, there are areas that overlap. As does psychotherapy, remedial work rests on a treatment alliance between the child and the adult, on a pact—spoken or unspoken—that the two will work together towards a common goal, that in spite of inevitable frustrations, occasional anger and, worse, boredom, they will stick together in the service of learning. Such an alliance cannot be taken for granted. The children who suffer from specific deficits have to work harder than their more fortunate peers. Few of them are anxious to give up play time or favorite TV programs in order to exert themselves beyond the demands required by the school.

It is true that among them are some who are very ready to form a treatment alliance. Their earliest experiences have taught them that it is safe to trust the adult. They have already acquired a measure of control; they are willing to delay gratification; they have incorporated something one might call "work ethos." Above all they have a degree of autonomy that stands them in excellent stead in the remedial process. Their early failure has not basically damaged their sense of self; they have remained—at least in the lower grades—curious and involved; and a candid and clear explanation as to what has gone wrong at school usually does wonders.

Let us assume that a severe dysnomia is a crucial factor in such a youngster's reading disorder. It makes sense to him if he finds out that his trouble evoking not only words but also the names of the letters of the alphabet and their sound equivalents is based on some difficulty with retrieval. Such a youngster might say: "*Now* I know why I can never remember the name of a movie even if I know exactly what happened, and why I had such a terrible time at first recalling the names of the boys in my class and why, when I sound out, I forget the first sound when I try to figure out the last one."

When the therapist then suggests that maybe his well-developed feel for the flow of a sentence might be a way to work around his difficulty, he is all

set to try and he will, in addition, make suggestions for mnemonic devices. He knows he is in need of help and he is relieved when it is forthcoming. His unconscious works *for* him rather than draining his ability to give of himself. He senses the therapist's respect for him and enjoys his cozy relationship with her; but basically such a youngster does not work to please the adult; he works because he enjoys mastery and finds pleasure in problem solving.

On the other hand, there are many children who come to us so bruised by an endless succession of failures, so defeated, that they are convinced that nothing will succeed. The therapist is fortunate if she can show them that they have failed not because they are abysmally stupid and incompetent but because a specific teaching approach did not meet their particular needs. One boy, for instance, whose visual recall of whole words is unstable, will be pleased to find that with a solid background in phonics he no longer feels lost when he meets with an unknown word. A different youngster for whom the fragmented kind of phonics that involves the smallest units does not work, will be delighted to find that an approach that uses larger segments, such as syllables or even sentences, will make the reading task easier. A different approach adapted to the child's very specific needs and the therapist's heavy support will often carry the day, at least if the youngster's feeling of self is intact.

Unfortunately, there are those who feel damaged and impotent, the object of forces over which they have little or no control. These feelings may go back to their earliest days and failure at school has merely confirmed their previous severe doubts about themselves. Hearty verbal reassurance on the part of the parents and the therapist is usually of little avail. Up to a point one has to protect these children from failure in the learning situation, but excessive praise and an unrealistic lowering of demands may have the opposite effect. An honest appraisal of the youngster's level of performance and a recognition of his potential strength are more helpful, at least if the relationship with the therapist is based on trust and honesty. In the last instance, it is the therapist's faith in the child and respect for him that reaches him at a deeper level and helps him to experience himself as a stronger and more capable person than he did in the past.

There are children who simply and flatly *refuse* to work and one must keep in mind that overt behavior does not always give one a clue as to what is behind such a refusal. There are youngsters who do not try because they cannot afford to fail. I am now thinking of children whose fantasies of omnipotence are severely threatened by any performance that does not come

up to their fantasies. Failure is intolerable because it constitutes a severe narcissistic blow. Telling this kind of child that there is really no need to excel, helps little because his resistance to trying is on an irrational basis invested with large amounts of psychic energy. It is the force of the resistance that points to its irrational source and if it is severe the therapist cannot always get through.

One observes a similar resistance—though based on different dynamics—in phobic youngsters. In spite of an often excellent relationship with the therapist and although they may be genuinely anxious for help such children do not "deliver." One sees it vividly in the many pupils who have a "thing" about writing compositions. They frequently have legitimate difficulties with the technical aspects of writing: with the handling of the pencil, with spacing, paragraphing, capitalization and punctuation or—and this is far more important—with the formulating of ideas in written form. None of it, however, accounts for their desperate fear of putting pen to paper. Realizing that their resistance derives from unconscious sources, we used to handle these situations overly permissively. On the basis of a trusting relationship—but only on this basis—we now insist that the child write at least a paragraph or two right from the start. We might allow him to use a tape recorder at first and have him take down what he dictated. We make sure that the material he writes about is invested *heavily* with affect, and it goes without saying that we refrain from correcting the technical aspects of his work. But we do insist that he push through, at least up to a point; that is to say, we support the healthy aspect of his personality. The relief if the child does push through is a revelation to him and the therapist. The overly permissive schools err in this respect. If the child fails to bring in his composition, he is told to deliver it in a week's or maybe in two weeks' time with the result that the youngster worries himself to death and, in some instances, has trouble falling asleep. Anna Freud says: "in the theory of education the importance of the infantile ego's determination to avoid pain, has not been sufficiently appreciated. If children lack guidance, their choice is determined not by their particular gifts but by the hope of freeing themselves as quickly as possible from anxiety and pain." To insist on delivery does not, of course, always work; much depends on the strength of the phobia and what it represents to the unconscious.

In remediation we always deal with two main variables; the severity of the specific deficit and the availability of compensatory resources. The latter is largely determined by psychological factors. In children who are fantasy-ridden and so preoccupied with daydreams that they have little or no

99

psychic energy available for academic pursuits, psychological aspects may be more important than specific deficit. Daydreaming is, of course, much less evident in a one-to-one situation when the therapist engages the child actively in some task, but it constitutes an interference when the child is on his own—during tests, when he does his homework, or when he is part of a large group in the classroom. For a first grader who has trouble listening, that is, processing material presented orally, the pull of fantasies becomes compelling. Involvement in daydreams is a very seductive occupation, and makes him less available for listening; thus, we may be confronted with a vicious cycle even when the child's specific deficits are not particularly severe.

There is still another group that presents massive difficulties for remediation but for different reasons: compulsive youngsters. They are conscientious; there is little wrong with the treatment alliance but they invariably get bogged down. When they are doing their homework, they spend hours sharpening their pencils, sorting out their papers; nothing, unfortunately, happens. They get lost in innumerable details. In the earlier grades at school they are sometimes referred to us because, in spite of their excellent background in phonics, they don't read, or read so slowly that they fall down on comprehension. The heavy emphasis on phonics fits all too well into their own doubt-ridden and cautious way of functioning. Such children don't take a chance. They refuse to guess from context and the surrounding syntactical configurations what their options are. They stick to details and tend to miss the point. They do not see the forest for the trees. We know, as a general principle in learning, that separate items, are quickly forgotten and that only when one has a framework to fit them into, will one recall the particular. Thus, the overly compulsive youngster may be at a severe disadvantage when it comes to grasping the essential of any subject.

There are, of course, conflicted, phobic and obsessive-compulsive youngsters who do manage; obviously it is also a matter of degree, but in cases in which intensive resistance and counter-productive mechanisms interfere drastically with the remedial process, a psychiatric referral might be indicated. It should not be done lightly and it goes without saying that it needs the parents' full cooperation which is not always easy to obtain because many of them look for educational help precisely because they feel uncomfortable about psychiatry. Parents will have to understand that the presence of specific perceptual and linguistic difficulties does *not* exempt children from emotional problems. On the contrary, so called "organic" youngsters or those who present significant developmental lags are far more vulnerable, emo-

tionally, than are others. In addition, in nearly all cases, a succession of failures has contributed heavily to their problems. It should be added, on the other hand, that hardly ever does psychiatric intervention obviate the need for educational therapy.

So-called minimally brain-injured youngsters are being so extensively described these days that I shall not discuss them in this particular framework. A number of the children we see, do, in fact, suffer from mild to severe central nervous system dysfunctions. But a far larger group—and the two may overlap—presents very specific language deficits as part of a neurophysiological lag—often, as Orton pointed out, on a familial basis. At younger ages such youngsters are poorly patterned and hyperactive. They have trouble attending and may have severe problems with impulse control, problems which in many cases are carried over into adolescence. Their perceptuo-motor performance resembles that of a chronologically younger group. Spatial and temporal sequencing present difficulties. They are indifferent listeners and poor processors of input and they have trouble conceptualizing. At kindergarten age and often later one is impressed by their emotional infantilism which may be viewed as one other aspect of their pervasive organismic immaturity. They continue to live in a somewhat egocentric universe. Aggression is crude and often non-verbal, at least at younger ages. Wish-fulfilling and magic solutions are ready at hand. An impressive number is preoccupied with food, that is, with early instinctual gratification. They have not moved from the pleasure principle to the reality principle, and they retain the infantile expectation that life should provide rewards without corresponding effort (de Hirsch 1975). Such children are not particularly good candidates for psychotherapy, mainly because they are not really conflicted. For the educational therapist they present long-term commitments. Such children may at first simply deny that something is wrong. In working with them one may find them basically friendly but explosive. They have not learned to tolerate frustration and delay gratification. They don't persist, they don't push through. For long periods of time, the therapist must "lend" them her own ego, as it were, help them incorporate her own attitudes: involvement in and devotion to a task, pride in achievement and the courage to persist even when the going is rough. The therapist must fully exploit the child's usually heavy dependence on her because such youngsters will at first work only to please the adult. Slowly, and as the work gets more rewarding, it becomes in itself a source of pleasure and interest. Eckstein (1969) says that from having learned to love, children must proceed to love of learning.

If I were asked what kinds of children I find hardest to work with, I would say: passive youngsters. Learning is in the last instance an aggressive act. Passive children are usually polite and—at least on the surface—willing to cooperate. Unfortunately, nothing much happens. Passivity may have stood such youngsters in good stead in the past; it may have kept them out of trouble. They don't appear to be angry; they yawn instead. Any therapist who has worked with passive adolescents knows that she is defeated if she fails to make the youngster carry the ball (de Hirsch 1963). Take a severe spelling disability—a subject most resistant to remediation. A clear explanation of the neurological basis of the disorder is a good thing to start out with. From then on, it is the *pupil* who must himself choose what avenue to pursue: reauditorization, revisualization, spelling rules, work on the roots of words and on prefixes and suffixes, using some of the ingenious suggestions presented by Carol Chomsky. It must be the pupil who has to find out which approach or which combination of approaches works best for him.

It is difficult to mobilize passive children because, often enough, they are not really involved in any area, not in hobbies or sports, not in the social scene, not in the age-appropriate problems they share with their peers. They lack the capacity for excitement about a specific period in history, or about some lab experiment, the kind of excitement about discovery that stays with one for the rest of one's life and that most often goes back to an intense relationship to some admired adult who has started one along the way. Because such children's relationship to the therapist is usually shallow and does not allow for identification, the therapist cannot fire them with enthusiasm and cannot help them when the road gets rough. Here again we have a parallel with psychotherapy. Both procedures are bound to fail if the youngster is unable to form a relationship strong enough to help him tolerate the many frustrations inherent in the educational and psychotherapeutic process (de Hirsch 1963).

Identification is the mechanism that carries the child over the vicissitudes of remedial work. It implies the internalizing not only of single elements but of the basic attitudes of the model. It implies that this attitude does not remain a foreign body, as it were, but becomes integrated in the learner's way of meeting the world and becomes part and parcel of his own internalized value system.

But identification is not an end in itself. It should point the way to autonomy. I have not found a definition of autonomy but I use the term here as it is used in some of the psychiatric literature, as an ego function: the

ability to invest in work for its own sake, independent of gratification—of being loved or rewarded—and unhindered by conflict.

What does this mean for the relationship between the child and the remedial therapist? I do not in this framework want to elaborate on the task of the educational diagnostician who has to unravel or at least to describe the interactions among the many forces that determine a child's scholastic effectiveness: his inherent endowment, his vulnerability to stress, the level of his neurophysiological maturation, his developmental status: perceptual, cognitive, linguistic, and interpersonal, the emotional climate of the home that has nurtured him, the social environment that has in part shaped him and finally the educational measures that have so far failed. In order to be effective the educational diagnostician needs extensive training in the field of developmental disorders in the broadest sense or at least a life-long experience with educationally disabled children.

I would rather discuss the traits desirable in the person who does the actual work with the pupil. Needless to say she should be familiar with a variety of techniques and ready to adapt them to the children's specific needs. She should not be an evangelist, a person so heavily wedded to one specific approach that this would make it hard for her to modify her technique. She should be familiar with the vicissitudes of each successive developmental phase. When she is working with the preschool child, she should expect the normal negativistic behavior of the 3-year-old, the bathroom talk of the 4-year-old, the swaggering of the 5-year-old. Without such knowledge she will hardly be in a position to judge whether or not her pupil deviates from the norm.

Needless to say, she must be familiar with the life style of the children she works with, the social group they belong to, and the social and ethnic background they spring from. I remember the indignation of a young therapist because her young Chinese charge was totally unable to express any negative feelings. The poor child would have been in trouble at home had he tried a more aggressive stance.

Identical attitudes and words may have an entirely different meaning even in the same social group. The use of the word "fuck" might reflect enormous progress in a middle class youngster who had previously resorted to hitting when he got angry—it might be entirely inappropriate in the next youngster.

Flexibility is of the essence. There are times when the famous "lesson plan" has to be dropped. Whatever the child brings in must be dealt with right

away: a fight with his teacher, a math problem, help with the organization of a report, as long as the youngster knows that the educational task he and the therapist have decided on takes priority. Flexibility refers to content as well as to method. Most of our youngsters have to learn how to learn and the task is easier when it is relevant. Dr. Jansky taught one of our bright adolescents, who had no idea what work meant, entirely around his main and only interest in life: animals. *He* taught *her* more about zoology than she would have learned in a college course. In the process, she demonstrated to him that he could use the very same traits—ability to organize and classify material, tolerate frustration (he wrote several manuals on how to handle a cobra)—in the service of other learning tasks. In the end he accepted all the tiresome routines and drills he needed to get into an acceptable college.

We take for granted that the educational therapist possesses a degree of empathy and intuitiveness and, indeed, I know some who simply can't go wrong. But I also remember watching a therapist working with a six-year-old boy who had terrible difficulties with drive control. The two were looking at the picture of a large giraffe in a cage. The boy eyed the animal with considerable misgiving and said half jokingly: "My, that giraffe would be dangerous if she would get out." "Yes," replied the therapist, "if she clobbered one on the head with her hoofs there would be little left." The boy made no comment but when the time came for his next session, he flatly refused to go. He did not really believe, at age six, that an animal in a picture book can get out of its cage. I believe that his malaise referred to his own unruly drives and his fear lest no one protect him from "getting loose" and destroying himself or others. There was no need for the therapist to be familiar with the theoretical framework behind this kind of reasoning. Nevertheless, she should have sensed that her remark would arouse anxiety on several levels.

Unfortunately, intuition, like tact, cannot be taught. It might help the student though, to watch someone else who instinctively chooses the right approach, not necessarily the same for each child. Learning on this level is a little like catching a disease. A sense of humor in a therapist is an enormous help. I remember a tiny creature—actually she was six years old but she looked like three—stamping her foot because she was made to wait for her turn. The student who taught her was indignant and she had a point, of course. But she entirely failed to see how comical it was when this tiny bundle of energy insisted on her rights, the same insistence that stood her in very good stead when it came to remediation.

Teaching styles differ and in general people do best if their personal style is not interferred with. I remember a 15-year-old who got a lot of fun out of tormenting his therapist. She never protested. She became kinder and sweeter, only her voice sounded higher and more tense. The boy got nastier by the minute. When it was over I said to the therapist: "That boy must have made you terribly mad." She was rather shocked and said: "Oh, *I* never get angry with my children." I then transferred the boy to another therapist who was entirely uncorrupted by psychiatric principles but who was pretty unflappable and who had a blessed sense of humor. When the boy started on her, she watched him for a while and then said (rather good humoredly), "Listen, buddy, I won't take it, I have no intention of being trampled on—you would think me an idiot if I let you." He sensed that she wasn't a bit afraid of his aggression and the session proceeded. By a combination of circumstances I watched the very same youngster with a third highly sophisticated therapist. Clearly, he was going to test her out, too. She took it up right away and said: "You are mad, aren't you?" And in a relatively short time the two together found out that he experienced the very fact of coming for remediation as humiliating, hence the nastiness. What I want to say is this: there are various approaches that may be effective but it is essential for the therapist to be close to her own feelings—negative as well as positive. Some therapists need to be loved. Anna Freud (1952), herself a teacher, said: "The teacher's role is not that of a mother substitute. If she plays the mother role she will get from the child the appropriate reaction—demand for exclusive attention and affection and the wish to get rid of all the other children in the classroom." The situation involving the remedial teacher and the child is, of course, different. One of its advantages for the youngster is *not* having to share the therapist's attention with his siblings. Nevertheless, there are pitfalls in this situation. I have seen remedial tutors who were quite seductive—this might be very threatening to the child. And there is the mistake most of us make when we start in this field: the tendency subtly to side with the youngster against the parent. This is unwise for several reasons; it intensifies the child's own conflicts and it may make him feel guilty—both interfere with work rather than further it. This overlooks the fact, furthermore, that in many situations both parents and the child may be in the right.

Absence of rescue fantasies on the part of the therapist is highly desirable. One's own need to salvage a youngster constitutes a subtle kind of exploitation and might result in considerable anger if the pupil refuses to be rescued. It is just as well to realize that, for better or worse, one cannot really

"shape" a child, except that occasionally one can provide—and this is true above all in the case of deprived children—a model of an adult who respects him and whom he can learn to trust in a world that is quite literally beset by dangers.

There is in all teaching a need for clarity and for structure. Absence of limits may make for severe anxiety and a few well-chosen rules are indispensable. Children cannot take toys home from the office; they must arrive and leave on time; missing sessions except for valid reasons is unacceptable. Nevertheless, there are occasions when structure must go by the board. A gift that has not been asked for might serve a useful purpose. Prolonging the session if the child has something important to communicate may be a necessity. There are therapists who structure their sessions to such a degree that they never get an inkling as to what the child is like and, above all, how he feels. A few years ago we worked with a four-year-old referred because of severe articulatory difficulties. He made remarkably little progress although he was on good terms with his rather rigid therapist. It wasn't that he was unwilling to cooperate, he was full of good will. But he was miles away during his sessions. We finally put him in front of the doll house where he became instantly and heavily involved in a play situation he himself had set up and which dealt with a vampire who sucked the boy doll's blood. It needed no probing whatsoever to learn that a vampire sucked *his* blood every night and that it was by no means safe either to fall asleep or to tell anyone about it. No wonder that these fears interfered with his freedom to learn.

While sensitivity to a youngster's anxieties is essential, it is *not* our business to interpret his fears for him (although in this particular case it was fairly evident that the child's three years older sister played an important part in the boy's psychic household). We have no right to get involved in psychodynamics. To begin with, we are not in a position to judge whether it is safe to weaken defenses in a youngster who may present severe psychopathology. In the second place, we cannot risk releasing affect that may result in unbearable anxiety or guilt on the part of the child; we should not open up situations we are unable to handle and finally and most importantly, playing around with psychodynamics might compromise our educational goals. Rawson (1974) points out that if we have our role and our responsibility clearly in mind, we do not have to become "amateur psychiatrists." On the other hand, we cannot afford to slam down the lid. It is essential to find out whether something is very wrong and we must listen to what the child has to say even on a nonverbal level.

It is very much our business, though, to deal with the child's feelings as they are reflected in the actual learning situation. A child comes in looking like thunder, for instance. He does not say anything but it is evident that he is boiling. Maybe he had a fight with a teacher, maybe he felt humiliated by a classmate, maybe his therapist, unbeknownst to herself, had hurt his feelings during the last session. In such a situation one *must* ask: "Hey, what's the matter?" If the youngster is not encouraged to vent his rage, the session will be unproductive because his mind will be somewhere else. It is entirely justifiable to tell a child who is dreaming: "You are quite somewhere else, aren't you? Is that the way it sometimes feels in class when you say you can't follow the teacher?" Assisting the youngster to recall and recognize what it *felt* like at certain moments might help him on the occasion when the situation recurs.

If the child is late for a couple of sessions it behooves us to find out why. There might be a valid practical explanation; on the other hand, his school report may have been abysmally poor and he might deny even to himself that something is wrong and assure himself and the therapist that "everything is O.K." It is essential for the therapist to find out whether this particular youngster meets unpleasant feelings and situations by denying them. And she might file away this tentative hypothesis for an occasion when something similar occurs during the remedial session.

There is finally the separation problem. It is, of course, a mistake to discontinue remedial work before gains are consolidated. But it is unwise to hang on. Separation may be as painful for the therapist as it is for the child (above all for the therapist who needs to be loved or adored). Fortunately, most children know surprisingly clearly when it is time to be weaned and they cheerfully discard the therapist when the job is done.

Kubie said that it is often difficult to know whether one has succeeded or failed with a particular child. Gains may show up later, rather than right away; on the other hand, an improved report card might mask lack of essential progress. The fact is, no one has yet found a way to measure with any degree of precision the many variables that go into educational progress. Just the same, one should at least try to find out why one has failed with a youngster one has done one's best to help. Is the pupil afraid to succeed? Why did a particular technique work with one child and not with the next one, although their deficits were quite similar? Why did the first youngster compensate for his weaknesses and the next one, equally intelligent, fail to do so? Maybe we have succeeded with the first pupil because we managed to

infuse either the subject matter or the relationship with enthusiasm. But why didn't we manage to do just that for the second child?

One thing is certain: In the process of learning, affective and cognitive streams flow together. In this particular child the affect that carried language was negative but it was strong enough to provide the energy needed to produce verbalizations in an emotionally heavily loaded situation.

To go back to the interactions between the child and the therapist: a strongly positive relationship will allow her to make realistic demands: such demands—as long as they are in the child's range—reflect the therapist's respect for the youngster. Respect is probably the most important single feature in the remedial relationship. I agree with Jansky (1972) when she says: "the teacher's confidence in the child's ability to learn will be experienced by him as a confirmation of his basic intactness and each small successful step will prove it."

To sum up: The learning ability of the children we work with, either has not developed or has been damaged. The goal in remediation is not to liberate the drives but to contribute to the growth of that aspect of psychic organization that deals with reality. It is silly to deny that the road is often rough.

Identification is the mechanism that helps the educationally handicapped child to submit to sometimes irksome demands. It should go a long way towards a wish for mastery.

What, in the last instance, are the goals of education? Surely not the amassing of information. It is sobering to remind oneself of the innumerable facts one has forgotten. I believe that there are fundamentally two goals and I have not found that extrinsic rewards are effective in reaching them.

1) Learning how to learn. This includes the mastering of tools. But it means, above all, to learn how to grasp the underlying structure of the information presented. This does not depend only on cognitive and linguistic factors, although a level of maturation is a prerequisite; it depends also on teaching. Many children can get hold of it in a one-to-one situation. They learn from the therapist how to go after essentials, after the principles, after the pattern.

2) Getting excitement out of learning is the second goal. It means among other things that the pupil be actively involved in the process, that he be willing to work on the techniques that will enable him to tear out the heart of a learning experience, and that with luck these tools become interesting and challenging in and by themselves. To achieve it, the pupil must internalize the teacher's attitudes and values by a process that goes forward on a conscious and an unconscious level.

Maybe Emerson (1940) put it best when he said: "If he can communicate himself, he can teach, but not by words. He teaches who gives and he learns who receives. There is no teaching until the pupil is brought into the same state in which you are: a transfusion takes place. He is you and you are he. There is a teaching and by no unfriendly chance or bad company can he lose the benefit."

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Reading Problems Worldwide

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The problems of intelligent children who have great difficulty reading, writing, and spelling are being looked at worldwide. Educators, speech therapist, physicians, psychologists, and many other professionals are asking questions about the significantly large group of children who display reading and learning problems in their native languages. It is apparent from these questions that they are very aware and are also engaging in active programs to detect and help such children. There are, of course, differences in what the industrialized nations have done as compared to the emerging nations.

In 1971, a French translation of a study of special education of the United Nations Educational, Scientific and Cultural Organization documented the state of education for handicapped children. Secretariats of the National Commissions of 38 member states were sent questionnaires (UNESCO 1971). Some of their replies indicate the state of special education. In Ethiopia, the respondent stated, "Education is not compulsory for either handicapped or non-handicapped children." "Handicapped children are in practice excluded from ordinary education," was the reply from Dahomey. In Syria, "There is no special provision made for handicapped children." Tanzania stated, "There is no compulsory education either for normal or handicapped children." In view of the fact that many emerging nations are just beginning to establish educational systems for their general populations it is not surprising that they are not yet able to consider the problems of intelligent children who have difficulty learning to read.

An educator from Tanzania, in answering a survey by Waller (1974) wrote, "As so many children never receive full time education, those with any type of problem would drop out unnoticed. It is a luxury for the better developed nations that they are able to concern themselves with this prob-

This paper was presented at the 27th Annual National Conference of The Orton Society, New York City, November 1976.

lem." In this survey in response to the question, "Is the problem of dyslexia (word-blindness or specific developmental language difficulties) recognized?" a number of replies are significant. Malta replied, "In theory, yes, in practice, not yet." In Saudi Arabia there is no official recognition of the condition, nor are any government funds spent in this area. However, Waller reports that official recognition of dyslexia has been achieved and government funds are being spent on this problem in Austria, Canada, Denmark, Finland, France, Germany, The Netherlands, Rumania, Sweden, Switzerland, and Luxembourg.

When we study reading and learning problems worldwide, it becomes immediately apparent that there are many levels of development in programs for such children in the "advanced" countries. Some countries are only beginning to explore diagnosis and remediation in reading or reading and spelling. The disorders of writing, concept formation, and arithmetic are still not being generally considered.

In 1974 and 1975, replies to survey questionnaires were received from 16 countries (Tarnopol and Tarnopol 1976). These countries included Argentina, Austria, Canada, China (Taiwan), Czechoslavakia, Denmark, Finland, Hungary, Malaysia, The Netherlands, Norway, Rhodesia, South Africa, Sweden, Venezuela, and the United States of America. It was possible to draw some generalizations regarding the incidence and methods of dealing with reading problems from the replies of the respondents.

The scope of reading problems in various countries is difficult to assess, especially because of language differences and because there are no internationally accepted standardized reading tests. In response to the question, "In your country, approximately what percent of nonretarded school children have reading disabilities?" the range was from one percent in China to 33 percent in Venezuela. There was a median of eight percent. Establishing percentages of reading disabilities is extremely difficult, especially as there is lack of an internationally accepted definition of this term. Most of the respondents defined reading disability as existing when a child read significantly below either his age or grade level.

Some respondents indicated that the ability to read is now being seen as a necessity and a right, with both professional and parent groups working actively to produce legislation which will recognize and provide funds for program development. Half of the countries surveyed have special full-time classes for children with reading or learning disabilities. With the exception of three countries, all provide special part-time programs in regular schools for

these children. Only seven respondents indicated that their countries had early case finding and failure prevention as part of their thrust. It is of interest to note that worldwide, the ratio of boys to girls requiring remedial reading was most frequently stated to be three boys to one girl.

In most countries, the children were usually tested for reading problems by an individual. Team testing was done in only a few countries. Psychologists, teachers, and speech therapists, in this order, generally performed the testing, which included standardized tests of reading, intelligence, visual perception, visual motor coordination, and auditory perception.

Generally speaking, pediatric and neurological examinations are sometimes done, while psychiatric examinations are less often performed. The Wechsler Intelligence Scales, the Terman-Merrill-Binet intelligence tests, the Illinois Test of Psycholinguistic Abilities, and the Bender Visual Motor Gestalt Test were most frequently used and in the order given. In seven countries, the psychologists had special training to test and work with children with reading problems. The number of school psychologists per 10,000 children ranged from one-half to eight, with a median of two.

Respondents indicated that the main causes of reading disabilities were neurological and genetic. In some cases, emotional causes were added. In Norway, it was stated that "Our population is highly homogeneous and the language is relatively regular. Therefore, the main causes of reading disabilities are assumed to be of genetic or psychoneurological origin." Czechoslovakia replied, "Heredity and minimal brain dysfunction." In Hungary, "disturbances of the underlying neurophysiological and psychological functions; especially speech disturbances, very mild manifestations of aphasia, disturbed feed-back or motor processes in speech, and genetically based disturbances," were seen as the main contributing factors.

Special courses to train teachers in techniques for working with reading-disabled children were available in almost all of the countries responding to the questionnaire. The best methods of remedial teaching were listed as "eclectic." Differential diagnosis and prescriptive teaching, phonics, and individual instruction were mentioned.

The problems of "teaching disabilities" adding to the burden of reading-disabled children was recognized by a number of respondents. Reading problems arising from inadequate teaching were estimated in Sweden to range from 10 to 15 percent. In Venezuela inadequate organization of the school system was seen as a contributing factor. In Norway, teaching defects were seen as a critical factor, with the respondent stating, "Even though the teaching profession is held in high regard in Norway, the traditionally-trained

teachers are too poorly qualified to provide remedial instruction. The college programs do not provide sufficient coverage of the special techniques used for detection and remediation of learning disabilities. Therefore, learning disabilities may arise and be sustained, due to teacher incapability."

Some possible specific teaching flaws from Hungary were listed as " . . . wrong sequence in teaching letters; faulty association between letters and pronunciation; and not giving the longer words gradually enough, so that the children soon become overloaded."

Terminology

Differences in terminology are frequently associated with differing opinions about the etiology and remediation of reading disability. There is great disparity within countries and between countries. Reading and learning disabilities in intelligent children are generally accepted worldwide, yet much controversy surrounds this area of education. It was surprising, therefore, to note that 18 countries (Tarnopol and Tarnopol 1976) had more similarities than differences regarding etiology and remediation. There was almost total agreement that the etiology of reading disabilities in children of adequate intelligence is most likely neurological with possible secondary emotional amplifications, and that it may often be genetic.

Some of the terms used by the representatives from the responding countries include reading disabilities, dyslexia, specific language disorders, learning disabilities, perceptual disabilities, instrumental disabilities, minimal brain dysfunction, legasthenia, and specific learning disabilities. Most respondents indicated that the reading problem was a difficulty in learning in spite of adequate instruction and opportunity to learn and in the presence of normal intelligence.

From other sources we learned that primarily the French literature is cited as generally giving precedence to emotional disorders as a primary cause of reading problems, with suspicion still being cast on the mother-child relationship. Cultural deprivation, low socioeconomic status, and transient status are also cited in many nations as causes of reading problems, but not of reading disabilities (Tarnopol and Tarnopol 1976).

The terminology used to describe reading disorders in each country seems to be related to local developments. The term "dyslexie" was first suggested in Stuttgart by Rudolf Berlin in 1887 as a form of word blindness that had previously been described by Kussmaul (Wagner 1973). This term is now in universal usage as "dyslexia," following the English form of the word.

Hungary, Austria, and Germany also use the term "legasthenia" (specific weaknesses in learning to read and spell) which was introduced by the Hungarian, Ranchburg, early in this century. The German-speaking nations also refer to "reading-writing weakness" (*Lese-Rechtschreibe Schwäche*).

British literature on the subject may begin with the Scotch ophthalmologist Hinshelwood's report in 1895 of some cases of wordblindness. This was shortly followed by reports from the English ophthalmologist, Morgan, and a school physician, Kerr, on cases of reading disabilities among intelligent children, one of them using the term "congenital wordblindness" (Strother 1973). Today, in Great Britain, "specific reading difficulty" seems to be used globally to refer to reading and perhaps writing, spelling, and number skills that are below a child's general abilities. Such children may also be called dyslexic or backward readers. The concept of learning disabilities often appears to be related to low intelligence (IQ as low as 50) in Great Britain, as well as to average or high intelligence.

The first Czechoslovakian publication dealing with reading problems appeared in 1904 and discusses a case of reading and writing retardation in the presence of adequate school achievement in other areas. The condition was referred to as "alexia" by a neurologist. Modern terminology includes "dyslexia" and "specific reading disability."

In Denmark, Edith Norrie established the Word-Blind Institute about 1931; however, her definition of "word-blind" has been the source of much controversy in their literature. At present, it appears that reading disorders may be called "reading retardation," "word-blindness," "learning difficulties," and "learning disabilities" in Danish literature.

In Canada no common terminology has been adopted. "Specific reading disabilities," "educational disabilities," "learning disorders," and "learning disabilities" are variously used. Belgian literature refers to "instrumental impairment" or "handicaps" to describe the condition of children whose peripheral organs function normally but who have academic problems associated with perceptual, psychomotor and linguistic impairments. Finnish children with academic problems who are not retarded are referred to as "reading-writing disabled." The phrase learning disabilities" is also used. Rhodesian psychologists refer to the reading problem as "dyslexia."

The term "learning disabilities" appears to be generally used in Ireland, The Netherlands, and the Republic of South Africa. Australians are talking about "specific learning disabilities."

In Norway, disabled readers are grouped according to auditory, auditory-visual, emotional, and educational dyslexia. These terms were developed by

Gjessing. They also speak of learning disabilities and specific reading disability.

Some Factors Related to Reading Problems

Although it is generally conceded that a major cause of reading disorders in intelligent children appears to be related to genetic and neurological dysfunctions with secondary emotional problems, there are still a great many children to be accounted for who may not be so classified. This is especially true in countries where the population is not homogeneous. For example, the population of the United States is quite inhomogeneous as compared to Norway, and this may partly account for the great discrepancy in reported numbers of reading problems. Moreover, in the developing countries even the concept of specific learning disabilities tends to be a luxury too remote for immediate concern.

An overview of the sources of reading problems in school children suggests the following list based on Eisenberg (Tarnopol 1969):

1. Excessive absences
2. Educationally deprived environment
3. Lack of environmental motivation
4. Lack of motivation due to emotional factors
5. Defects in teaching
6. Chronic illness or malnourishment
7. Severe vision or hearing losses
8. Mental retardation
9. Brain damage
10. Genetic or congenital brain dysfunction

Reading problems may be caused by any one or any group of these variables (Tarnopol and Tarnopol 1977).

Environmental Factors

Reports from many countries indicate that lower than average socioeconomic status tends to be related to generally depressed reading and learning levels. Another factor related to low reading levels is a student's minority status, especially when the minority comes from an ethnic or national group that does not have a history of educational development in its background. The combination of minority status from an underdeveloped

country and lower socio-economic level places some children in double jeopardy. In many cases the problem is compounded by the fact that the child's first language is not that of the country whose school he is attending. Other environmental factors tending to retard children's learning are transient status and any other things which prevent steady school attendance.

The National Reading Council in the United States of America commissioned the measurement of the national "survival" literacy rate. They wanted to find the number of Americans unable to "survive" because they were lacking in practical reading skills. They found that suburban residents did better than rural inhabitants on measures of reading involving the ability to fill out forms such as those used for Social Security, a driver's license, or public assistance. Illiteracy decreased in direct proportion to income. Among whites surveyed, illiteracy was about half that of blacks. The young were the most literate. Women surpassed men in literacy (Dempsey 1972).

In a reading comprehension study done in 15 countries using a standardized reading test translated into each language, it was found that reading levels in the three developing countries fell far below those in the economically developed countries (Thorndike 1973). In the economically poorer countries, major problems were found in the availability of educational facilities, teacher training, class sizes, special education, and remedial programs. This is an example of the debilitating influence that the total educational environment may have and seems to indicate that "schooling does make a difference."

Structure of Language

The structure of language in terms of the relationships between spoken and written language seems to influence the degree of difficulty encountered by children learning to read. Of the languages investigated in this study, it appears that the original Chinese pictographs may be the easiest to learn to read, followed by the newer ideographs. The next in order of difficulty appear to be the most phonetic languages, probably followed by the less phonetic, and finally the least phonetic languages. In this respect, English appears, under common teaching procedures, to be one of the most difficult languages for beginners. However, there is some evidence that the order of difficulty may change for advanced reading comprehension.

A number of factors make it extremely difficult adequately to compare languages for difficulty in learning to read. The greatest problem is the lack of equivalent standardized reading tests in the different languages. Second, many

countries do not have standardized reading tests that they can use to determine the relative reading levels of the children in their own countries. For this reason, the percentages of nonretarded children with reading problems reported from different countries are often based on subjective estimates and are certainly not comparable. Since socioeconomic level, minority status, transiency, population homogeneity, adequacy of the educational system, and so forth, affect the reading level of a population, the problem of comparing languages for relative ease of learning to read is compounded.

Remediation

Investigation of the approaches used in many countries to remediate reading problems in children indicates that no single method appears to have been adopted universally. Moreover, there seems to be no individual nation in which a single solution has been found for all reading problems.

Bullock Report

The British Bullock Report, "A Language of Life," stresses the principle that there is no one method or philosophy that unlocks the process of learning to read (Bullock 1975). The point is made that for four centuries the main arguments about how reading should be taught have been "advanced, contested, revamped, discredited, and rediscovered." The report continues, "Today's discovery was often yesterday's discard, unrecognized as such, or rehabilitated by some new presentation. There have certainly been advances and some valuable innovations, but the major arguments are substantially the same as they have always been, and too much attention is given to polarized opinions about method." The committee further felt that improvement in the teaching of reading will come only from a detailed study of all of the factors involved and how they can be influenced. This understanding should influence teacher training, the organization of teaching, and other resources. Finally, the committee states, "The majority of children require precise, well organized instruction if they are to become successful readers."

Survey of Methods

In the United States, Chall (1967) did a survey of methods of teaching reading from which she observed that people often tended to be emotionally

tied (or married) to a particular method of teaching and so were constrained to defend it. Chall asked why some children fail to read. The replies from authors of basal readers, and from proponents of phonics, linguistics, alphabet reform, or language experience, all indicated that a return or new approach to their method would prevent reading failure. Chall stated that this emotional attachment was "more often characteristic of religion and politics than of science and learning."

Chall cites Fries' review of the literature from 1570 to 1900 on methods of teaching reading. He uncovered a "succession of discoveries and rediscoveries including alphabet reforms, word methods, sentence methods, phonic methods—each claiming to be the new natural, true, logical way to begin reading." Chall's own reinterpretation of the studies of method she examined afresh indicated clear superiority of those *beginning* with emphasis on the coded relationships of sound and symbol—that is, some form of phonics.

Prescriptive Teaching

The thrust of this research appears to be that "there is nothing new under the sun." On the other hand, from our study of *remedial* reading methods in many countries, it may be concluded that something new has been added. A relatively modern innovation is prescriptive teaching. It appears that prescriptive or diagnostic remedial teaching is being done in all developed nations. The modern feature of such teaching is in the nature of the test battery used to diagnose specific learning disabilities (Tarnopol and Tarnopol 1975). The tests explore the basic sensory learning modalities including visual, auditory, and tactile perception; motor coordination and equilibrium; and the visual-auditory-motor modality interactions. In each sensory area, measurements may be made of reception; immediate, short-term, and long-term memory; integration; and expression. Finally, the results of these tests are coordinated with the results of tests of language, academic achievement, and intelligence. A further modern feature of testing is the development of standardized tests with population norms, which have been carefully checked for both reliability and validity.

Many psychologists, teachers, and language therapists are learning how to develop an individualized teaching program for children who have been tested. There is evidence that in severe cases of specific learning disabilities, this approach may succeed when other approaches to teaching the child have failed (Calancini and Trout 1971).

Conclusion

In every country surveyed, there was an awareness of both the existence and the needs of intelligent children with specific reading and learning disabilities. In those nations where no special educational provisions are as yet made to assist these children, many people are attempting to bring this matter to the attention of the appropriate educational or governmental authorities. Most of the industrialized nations now have at least some special programs for these children and it appears that there is a rapidly growing movement to develop similar programs in other countries. There is reason to feel optimistic about future developments in helping children with reading problems worldwide.

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Learning Disabilities in German Children

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Introduction

There is no uniform German child, no uniform learning disability, no uniform German legislation and certainly no uniform program for learning-disabled children. Thus, it is somewhat difficult to attempt an overview which is neither too detailed nor too general. For greater interest and understanding it might be best to give my subject a framework, that is, to outline the overall picture in which the disabled learner finds himself in Germany.

Special Education is but a part of the total educational scene and it in turn is part of a changing society. Without a look at the whole as well as at some major forces influencing education, a description of specific programs might remain more or less meaningless.

Frame of Reference

Geographic, economic, political, and cultural differences make any systematic comparison between Germany and the U.S. nearly impossible. Yet, many of us go abroad to meet, to exchange views, to observe, to learn. . . . It must be that by looking over the fence by observing our neighbors' life style—even if we will never share or copy it—we at least find new perspectives for our own ways.

West Germany's Minister for Economic Cooperation, Egon Bahr, travelling informally in the United States in 1975, took 30 days to drive from San Francisco to Chicago and then summarized his impressions. He found himself impressed by the vastness of this country and the amazing traffic safety, by "television commercials killing off each other", by the violence on television (accepted as entertainment!), by the unimaginative food, the condescending

This paper was presented at the 27th Annual Conference of The Orton Society, in New York City, November 1976.

attitude of Americans toward Europeans, their "terrible ignorance in international affairs" and, finally, their lacking awareness of their responsibility in the world! (From an interview printed in Time Magazine, Sept. 22, 1975) Had you or I travelled the same distance in the same manner, might we have come to entirely different conclusions? Misunderstandings, misinterpretations happen all too easily as long as people do not know enough about each other's living conditions.

Returning to Germany after a decade in California, I, too, in reverse, became aware of the smallness and the crowded conditions in Germany. It barely matches the size of Montana and we would have to place all the inhabitants of California, New York, Illinois, Ohio, and Tennessee into the State of Oregon to have a picture of the population density in Germany.

How such external factors influence mentality and educational practices can easily be demonstrated by just one example: the majority of German families does not live in a home of their own but in apartments either rented or owned in common (condominiums). Living quarters, classrooms, and stores are small, everything is crowded. Many houses are lightly built; every bit of noise carries. Because of the midday main meal and siesta, noisemaking is legally prohibited between noon and two PM, meaning that children must play quietly inside their houses and outside, from the moment they return from school. Taking all this into account, one no longer finds it difficult to understand that most German parents and educators still consider quiet behavior, cleanliness, and obedience very desirable traits in children. Times have changed, German schools no longer are places of stern drill, yet the German child in general still appears more disciplined and inhibited than his American counterpart. I am familiar with both cultures and my personal observations tell me that the German child is easier to live with and to teach than the American child. However, in the long run, when both reach the end of their teenage years, the young American seems better balanced, more mature, more communicative, better able to express his thoughts and feelings verbally. The German youngster probably has been forced to repress too much too soon and thus tends to be either more withdrawn and insecure, or more aggressive and rebellious. These are generalizations, of course, yet the difference is apparent in adults as well: an American strolling in a German street will be recognized at first sight; his relaxed posture gives him away.

Aside from these realizations upon my return to Germany, however, I was even more impressed by the Americanization of Germany. It is apparent not only in commercials, in TV serial programs (Bonanza, The Waltons, The

Streets of San Francisco, Manhattan Beat, Sesame Street, etc.), in imported goods on the market, in pop music and fashion, but also, more significantly, in the various scientific and technical fields as well as in the language. Scores of American words (trainer, dealer, paper, center, team, trend, city, shop, computer) have become part of the everyday vocabulary. Vice versa I can think only of Weltschmerz, Leitmotiv, Angst, Zeitgeist, Gestalt and Kindergarten, and except for the last these are not commonly used in America.

It would take us too far even just to begin a description of the American influence on German science. I can only say that of the three fields with which I am most familiar, social work is nearly entirely patterned by American models, psychology is deeply immersed in its American counterpart, and education looks to the United States for ideas and innovations (as does medicine). American books overflow the German market, especially in the scientific fields. Every day I pass by a large bookstore in Munich, carrying medical and psychological literature and at all times 50 percent of the books in the windows are in English. Of the other half (all in German, no other language!), about 10 percent are translated from the English, i.e., from originally American books. Before the seventies it took 10 to 30 years for an American book to get translated and published in Germany. Now it often takes only three to six years. The table on page 115 is not in any way conclusive, but it illustrates my point.

Another example: Margaret Rawson, current editor of the *Bulletin of the Orton Society* edited in 1974 a revised edition of the "Bibliography on Nature, Recognition and Treatment of Language Disabilities." It contains a special section entitled "References Published Abroad"; of the 27 publications listed only 3 are in German, 12 are in English, the rest in Swedish, Dutch, etc.*

The American impact on German education warrants an investigation all of its own, it is so complex and interesting. I can only mention a few aspects as they have happened to have come to my attention.

Doman's book, "*How to Teach Your Baby to Read,*" had in Germany almost the same impact that Sputnik had on the American educational scene in 1957!" "Look, the Americans are getting ahead of us, there two- and four-year olds know how to read." And immediately the so-called "Early Reading Movement" swept across the country, leaving in its wake confused

*This represented a beginning estimate of needs and interests of generally monolingual American readers, and titles submitted to the editor, rather than an attempt at an international literature survey!—Ed.

	Year of Publication		
	US	Germany	Elapse of time
Dollard et al.: Human Behavior	1939	1970	31
Axline: Play Therapy	47	72	25
Wineman and Redl: Children Who Hate	51	70	19
Getman: Develop Child's Intelligence	52	67	15
Horney: New Ways in Psychoanalysis	39	51	12
Walker: Elementary Statistics	43	54	11
Kirk: Exceptional Children	62	71	9
Holt: How Children Learn	59	69	10
Holt: How Children Fail	64	72	8
Glasser: Reality Therapy	65	72	7
Berelsen & Steiner: Human Behavior	64	71	7
Trieschman: The Other 24 Hours	69	75	6
Guilford: Analysis of Intelligence	71	76	5
Johnson and Myklebust: Learn. Disabilities	67	71	4
Holt: Freedom and Beyond	72	76	4
Wender: The Hyperactive Child	73	76	3
Moore: Better Late Than Too Early	75	76	1

kindergarten teachers, anxious parents, and toddlers already labeled "failures." The New Math and Early Education Movement followed suit. Was not Bloom teaching in the U.S. that 50 percent of a child's intelligence was fully developed by age four?

Other educational news items from America that were taken up eagerly in Germany were these:

- –intelligence can be made;
- –the age of five is an arbitrary point at which to start formal schooling, it should begin earlier;
- –language is the most important single factor in academic success in school;
- –it was considered a crime by Americans themselves to have but 6 percent of the three and 19 percent of the four-year-olds in school; what then with us, the Germans, having only one-third of the five-year-olds in kindergarten?

—baby-sitting functions in day-care centers are a waste of time! Only education started sooner would improve educational success (Dr. Levinson: "The Great Society's Poor Law");
—early intellectual stimulation, the experiments had shown (psychologist McVicker), could increase a child's IQ by 30 points!

These claims reached Germany at a time when educational reform happened to be in the air. They were taken up eagerly, sometimes indiscriminately, and fitted into educational as well as political themes. The politicalization of educational issues, of course, is not particular to any time or nation. California Congressman Tunney in 1970 was quoted in a nationally-known magazine as asking "How Smart Do You Want Your Child to Be?" Answering his own question, he said he wanted to see every three-year-old in school because ". . . an IQ can be boosted by parents and teachers; a level of 150, now considered near-genius because it is so rare, may be attainable for many or even most children!" This was what parents wanted to hear at that time.

Yet as early as 1967, Eda Le Shan had been warning in the United States, "Rather than encouraging a love of learning, we seem to be making many of our children more and more terrified of school"; she thought it difficult to find schools that considered "the making of a person, not of a student" their central goal (in *The Conspiracy Against Childhood*, New York: Atheneum).

More recently Helen Beck called her book, *Don't Push Me, I'm No Computer* (McGraw-Hill, 1973). ". . . a plea to stop pushing children beyond their stage of maturation."

In 1975 Moore and Moore felt that a good home, offering reasonable freedom and the possibility to be alone might well be "the best possible environment for a child's development" (in *Better Late Than Too Early*).

These voices remained unheard in Germany, and by now parents have been sufficiently influenced by mass media, politicians, and economic conditions to be equally eager to exert pressure for early cognitive training.

Then news came about America's giant programs in compensatory education, especially Headstart, the scope and financial support of these projects were looked upon with a mixture of awe and envy. Then came emancipatory, anti-authoritarian and peace education. New educational programs were hastily put together and experimented with, often with little regard to the cultural, mental, social, and other differences between the two nations.

Swiss historian von Salis wrote in 1955 (Weltgeschichte der neuesten Zeit, Bd. II, Zürich): "In all areas of human life and human activity in our

time American principles, American methods, American inventions and technological accomplishments . . . have given a new direction to the history of our days." Now, after 20 years of ever-increasing influence, the first signs of rejection can be noticed. The younger German generation especially is growing tired of having the United States held up as an example; they look in other directions, some even resenting the American power, wealth, and influence. This mood may be encouraged by Germany's steady economic growth, bringing a new feeling of independence to Germany.

Educational reform in Germany was propelled by the American education explosion. The reform began in Germany about 20 years ago, but did not gain momentum until the mid-sixties. At this time two vocal education representatives spoke out provokingly. Georg Picht (Die deutsche Bildungskatastrophe, Olton und Freiburg, 1956) announced his claim of "every citizen's right to education". In addition, OECD Document ED 19, of November 1971, an international comparative study, described Germany's educational system as "outmoded." Only later, when the shock provoked by these pronouncements had worn off, did it become known that the study was faulty and outmoded to a degree, but, too late, what became known in Germany as an "educational euphoria" (Bildungseuphorie) already had been set into motion.

Suddenly everybody was eager to reform education and the school system. Germany not having a federal department of education and the eleven states holding on tightly to their sovereignity in educational matters, it was found necessary to form two coordinating and facilitating institutions: the "Permanent Conference of the Cultural Ministers" (Ständige Kultusministerkonferenz) and the "Federal-State Commission" (Bund-Länder Kommission). In 1970 the latter presented its "structural plan" (Strukturplan) to the public, which outlined the reforms necessary to guarantee, as the United States was doing, more and better education for all. Some of the plans outlined therein have been realized by now (more and better buildings, more pilot studies, better curricula, more alternatives offered to students). Many others seem abandoned, partly for political, partly for educational, and mostly for economic reasons. The ideas had been greater than the financial resources.

Still, in the course of this reform plan, American type comprehensive high schools and American type kindergarten classes were started. In most States today efforts are under way, despite much public resistance, to lower compulsory school age to five.

At the moment, reform ideas are being brought back to reality by economic factors. The job market can no longer absorb all the young graduates; this is especially true of teachers, educators of all kinds, psychologists, and social workers. Furthermore, the universities can no longer accommodate the masses of high school graduates. Only a "closed number" (*Numerus clausus*) is accepted; many students wait for several years (even if they are straight A students), others are forced to take up subjects or to major in areas they never had intended to study. Graduates from vocational schools fare no better; only a few find jobs or apprenticeships.

Certain political forces (mostly of socialist coloring), wanting to see radical societal changes use this situation for purposes of their own. Thus, an official government paper, called the Second Family Report, was issued last year. It claims that the German family has proved to possess too little socialization potential, that the family is an obsolete structure, held together mostly by tradition and church teachings, that the family is a social island, with parents exerting too much power. The Family Report, therefore, calls for "true alternatives to the family," for promoting communes, for the breaking open of parent-child relationship, for earlier and longer schooling, for day-care centers allowing more mothers to work. The whole thrust is toward estranging children from their families. These ideas in an official government paper, are in direct opposition to the German Constitution which guarantees "special protection" to the family and "the natural parental right as well as duty to educate their own children."

This Family Report is not an isolated phenomenon. Other papers, legal drafts, televised children's programs, laws already in power, the recent tax reform, and parts of public school curricula discriminate against the family, against the role of "Only Housewife and Mother," against children and their very basic needs.

That school systems, institutions, and reforms, despite all their modernistic and scientific ways, accomplish little (and will certainly never replace the educational benefits of the family) can be seen by current problems that are discussed widely in the German press. One of these problems most commonly reported is the so-called "school stress." So much pressure for academic performance has been exerted on the German child, down to the four- and five-year-olds, that behavior, learning, and health problems are growing constantly. Every year now 500 children in Germany commit suicide, most of them because of school phobia, and 15,000 attempt suicide! Every 10th child must repeat a grade.

The problems are increasing with children spending more and more time at school, in day care centers, before the TV screen, with mechanized devices instead of with their own people, in large peer groups instead of at home, as both parents work, leaving them with neither time nor strength for their children. The problems include inattention, hyper-activity, aggression, drugs, alcohol, dropping out of school, banding together, and criminal assault. (In Munich these days one school has been terrorized by a group of students violating and mugging their own peers; it has been taking several full-time policemen to keep order.)

Or, to give just one more example: a well-reputed German weekly paper ("Die Zeit") on Oct. 29, 1976, printed an article headed: "Where Children Learn To Be Ill." Two subtitles say: "Students, Parents, Teachers Identify A Common Opponent: The Inhumane School." "Pleading For A Human And Dignified Approach To The Young Generation." The article claims that schools are becoming inhumane, and the following indications are cited. The schools select mercilessly so that an undignified competition for better grades takes place in classrooms; the consequence is anxiety on the part of teachers, parents, students, and increased pressure and stress for all concerned. Academic expectations, the "absurd scientification" and "artificial terminology" applied serve not the student but the prestige struggle of the scientific disciplines among themselves. The size, teacher turnover, organization, anonymity, bureaucratization, and computerization of the schools cause an impersonal atmosphere not conducive to learning. Finally, school architecture is geared to economic and functional efficiency, reminding one of huge office buildings rather than of learning spaces where students can experience a sense of well-being.

Two parents' organizations have been established in 1976 as pressure groups. Both strive to reduce the academic pressure and the "elbow mentality" in the classrooms. Their names are indicative: "Humane School" and "Advocate of the Child."

With children's natural and basic needs for security, closeness, guidance, protection from themselves, parental example, identification with the parent of his own sex, etc., violated at an ever earlier age, with the precocious fostering of intellectual rather than emotional growth, one might ask whether learning disabilities are not, at least in part, due to societal changes. Parents, educators, politicians, reformers, law-makers, producers, all want the "best" for our children. But, have we possibly lost sight of what constitutes "the best"?

Learning Disabilities in Review and Overview

If regular education is in such turmoil, what can we expect for the learning disabled? People in this field are propelled by idealism but limited by reality, including insufficiently trained personnel, high student teacher ratios, lack of methods and experience, and, especially since last year, an economic recession putting a stop to research funds, building plans, employment, etc. In Munich alone 120 psychologists and even more teachers are on unemployment rolls; they are badly needed in the schools and related institutions, but there are no funds to employ them.

Even if we had perfect schools with small classes and optimal teaching, there still would be students who would need special help and programs more specialized and individualized than conventional schools can offer.

In the case of severely handicapped children the need is apparent, but, the more subtle the exceptionality of the child, the more difficult it becomes to decide what ought to be done, by whom and how.

There is much agreement about "exceptionality." The Council of Europe for instance (founded in 1949 and the most comprehensive European organization, having 17 member states) has agreed on the classification: sensory, speech, physical, mental, and social handicaps; this does not differ much from American nomenclature. The estimated frequency of exceptionality in child populations ranges from 10 to 12 percent in the States and is slightly below 10 percent in Germany.

Matters become much more complicated when we look at the "learning disabled" group. While in 1969 in the United States the "Children With Learning Disabilities Act" was passed, in Germany there is to this day no uniform or even coordinated legislation. Immediately preceeding my flight to New York, I attended a conference sponsored by the German Research Society (Deutsche Forschungsgemeinschaft), a federally supported agency doing research in all areas of public interest. This particular meeting was the very first of its kind: 28 nationally-known German experts on dyslexia had been invited to state their views as to what will be needed in the future in terms of research, diagnosis, prevention, and treatment of dyslexia. This was the first interdisciplinary "Round Table Discussion" on dyslexia ever. Nothing revolutionary was accomplished, but the various disciplines at least for once listened to each other, tried to agree on certain terms, needs, and programs, and decided to continue to work together on specific projects.

Until about 1950 the term "dyslexia" (in German-speaking countries

since 1916 referred to as "Legasthenia") had remained virtually unknown. Between 1960 and 1970 all states issued some rules or legislation, started some programs in the public school system, and a number of university-affiliated children's hospitals, child guidance clinics, and psychologists in private practice had begun—every one more or less on his own—to work for and with dyslexics.

While aphasic and alexic cases have been known to the medical profession for about a century, the more subtle learning disorders, at first almost exclusively of reading-writing disabilities in Germany, received attention first from the educational profession in the early fifties. But dyslexics were distinctive; they formed a special group of learning disabled children. Other learning disabilities, such as dyscalculia and hyperactivity, have come to a broader attention only within the last year or so.

Because educators became sensitive to these children first, almost all special programs today are offered through and within the public school system, free of charge. This is not quite as good as it sounds, though. There are, by far, not as many programs as are needed. Special teachers have been trained hastily, often in no more than six two-hour sessions! There is very limited testing and selecting for special classes. Usually there are too many children in one group—up to 18—to receive the individual attention they need. The programs are carried out, from selection through to dismissal, in the majority of cases, without the help of any psychologist, pediatrician, or other related professional.

Not only is there lack of interdisciplinary cooperation, there is a "fight for power" going on (referred to as "territorial war" by Dr. S. Kirk when he spoke of the American Scene during the Orton Society conference in November 1976). Each discipline claims to be the one and only having the competency to concern itself with dyslexia.

Psychologists often consider dyslexia a symptom of repressed problems and thus a neurotic conflict.

Physicians claim that if students were taught correctly, they wouldn't have legasthenia; or that students with dyslexia have central nervous system disorders and therefore need medical treatment only.

Teachers often want to believe that social deprivation or family shortcomings are at the bottom of their students' disabilities.

School politicians and administrators want to hold on to prestige and power. They want to restrict dyslexia programs to the public school systems, exclusively.

These limitations do not mean that there is not some very good teaching going on. There are at least 60 books on the market concerning themselves with legasthenia. Each state has some legislation pertinent to the problem. More private individuals as well as private institutions are beginning to specialize in learning disabilities. Since 1975 for instance there has been a "National Association For Children With Legasthenia," a very active parent organization.

In Germany it is estimated that at least 50,000 children on each grade school level suffer medium to severe learning disabilities, thus needing special educational help. Not all of these receive it, but as far as possible they are helped in these six general ways:

1. Individual or small group private projects: practitioners or institutes. (These are expensive and not enough available; some are not professional, but are merely people trying to cash in on the need.)
2. Diagnostic and preventive teaching in the early grades (free of charge).
3. Special groups in the public school system: a) within child's own class room; b) within child's own school, from various rooms; c) at a centrally located school to which students are transported
4. Special Classes (LRS). Usually in centrally located schools, these classes are "self-contained." They have 8–15 students (depending on state legislation) and individualized teaching. Teaching in these classes is therapeutically oriented, building on strengths, bringing up weaknesses, focusing on the experience of success. By 5th grade at the latest pupils are expected to be ready to return to their regular class, even if for some time they continue to attend special groups to facilitate the transfer.
5. For the past few years there have been 3 or 4 boarding schools for dyslexics, mostly for older students, especially those headed for college, who in the regular schools find no help whatsoever.
6. Most states now have special legal provisions pertaining to grades and to promotion. The report cards of students attending special reading classes do not show grades for such subjects as reading, spelling, or literature, and these students cannot be made to repeat a grade if they fail only in the subjects directly related to their disability. In some states there is now even a waiver for "Abiturienten" (equal to beginning junior in college).

As unique LRS-projects of general interest the following might be briefly mentioned:

1. The state of Schleswig-Holstein is creating a state-wide counseling service. It will provide, among many other services, differential diagnostic assessments and counseling for LRS-students, their parents, and teachers.

2. In the state of Rheinland Pfalz the Education Department edits and distributes an information sheet for parents and teachers of LRS-students, containing a host of valuable practical and bibliographical facts.

3. In the state of Niedersachsen every school must provide one coordinator who is in charge of all programs and needs concerning LRS-students.

4. Very recently the state of Hessen developed a total "Learning Program" for LRS-children. Special emphasis is given to cooperation among parents, teachers, school psychologists, and child guidance clinics.

5. The city of Hamburg provides extensive consultation services at the schools for parents who wish to work at home with their reading-disabled youngsters.

6. In West Berlin a special commission has been created by the State Education Department in order to develop a "Special Educational Model for LRS-Children." Berlin also has "Educational Counseling Center" that provides information by telephone. Berlin has, in addition, a substantial private reading clinic.

Incidence, Identification and Causation of Learning Disabilities

Despite decades of research it is nearly impossible, in Germany as well as elsewhere, to give an exact figure as to the frequency of learning disabilities in child populations. The difficulty lies in the term itself which cannot be adequately defined; it lies with the criteria used in research, with the diagnostic procedures, and with the viewpoint of the researcher.

Operational definition of at least one learning disability, namely dyslexia (legasthenia), has been applied by German school systems in selection procedures; i.e., a group intelligence and a group spelling test were administered to potential dyslexics. When the IQ was in the normal range and the spelling test result in the lower percentile, then the child was admitted into special programs. Some states declared an IQ of 90 as cut-off point, others an IQ of 80 or 75. Some states considered 15, others 5, a low spelling percentile. How questionable such practices are needs no further comment.

Test results may look "objective" and "scientific," but they can be misused. One German author (Angermaier, Fischer-Bücher, 1975) writes: ". . . scientific consideration must take second place. . . . As paradoxical as it

may sound: we will have to set the cut-off points on intelligence and spelling tests in such a manner that a desirable percentage of dyslexics results. For it makes no sense to fix these cut-off points so that we get more dyslexics than we can help forward within the school system. School politicians and, in the end, the democratic public will have to ask themselves which percentage of dyslexics is to be helped and the diagnosis of dyslexia has to go by that" (translation by this author).

As everyone in the field knows, any test is only partially reliable and valid; the reliability and validity of group tests and poorly standardized tests tend to be especially low. Yet, these two questionable kinds of tests are usually administered by superficially trained teachers (who may have had no more than two credits in continued education or a six week workshop). Behavior observation, family background, subtest profiles, personality factors, early development and other such factors are not taken into consideration. With such definition and identification procedures it is not surprising to find that dyslexia frequency estimates range from 2 to 25 percent.

Research as to causation still moves in the realm of open questions and suppositions. Here, especially, much depends on the viewpoint of the researcher. Milieu theorists, behaviorists, analytically oriented psychologists, school administrators, linguists, education reformers, didactic specialists all look at dyslexia from their particular points of interest.

Accordingly one can find various causal explanations. German physicians for instance have a tendency to "blame" the whole word ("look and say") method. This, despite the fact that in Vienna for instance this method had never been introduced and that there are as many dyslexic children there as elsewhere. In addition, for at least the past four years German first-graders have no longer been taught by either only an analytic or only a synthetic method, but by a mixture of both.

Educators tend to self-critical publications in which they blame poor teachers, crowded classrooms, and inadequate reading methodology for the seeming increase in dyslexia.

Psychologists, sociologists and other social scientists seem to think that school stress, parental ambition, the overly stimulating environment of a modern civilization, and such factors cause, or make manifest, more learning disorders than were known formerly.

One of the newest publications (by Trempler: Herder-Verlag, 1976) claims in all seriousness that dyslexia is nothing but a deep emotional disturbance due mostly to maternal rejection! Another (Sirch: "Der Unfug

mit der Legasthenie," 1975) goes so far as to say there is no such thing as dyslexia, there is only ignorance and bad teaching! And Schlee (Verlag Urban & Schwarzenberg, 1976) believes that research on dyslexia has reached the absolute end of the road, that it should be discontinued immediately and replaced by research on learning and teaching! But then, even extreme positions contribute to the general discussion and clarification effort. It is my hope that in time a more interdisciplinary cooperation will become possible.

Learning Disabilities: A Look at the Future

While learning disabilities remain a problem in theory as well as in practice, at least the practitioners, those who have seen and have worked with learning-disabled children, find many points of agreement. The most important of these is the realization that each child has *his* learning problem, *his* dyslexia, *his* hyperkinesis, or *his* dyscalculia. "Not all children are alike," as Dr. Kirk said during the 1976 Orton Society conference. My own view is that dyslexia (and most related learning disabilities) are primarily neurogenic and depend only secondarily, i.e., in their particular configuration, shape or degree, upon personality, milieu, and other factors.

Team-work in Germany so far remains the exception. My hope for the German situation is that the representatives of the more medical term "partial performance weakness" and the representative of the more educational term "learning disabilities" will combine forces under the "psychoneurological" approach. I have discussed this briefly (1970, Klasen, E. *The Syndrome of Dyslexia.* Huber, Bern, Switzerland, and 1972 University Park Press, Baltimore, Md. USA) and the idea is now making its way into Germany, mainly through the translation of Johnson and Myklebust's *Learning Disabilities.* This book was published in the United States in 1967, and its German translation became available in 1972.

Aside from a more interdisciplinary approach Germany's needs in terms of the future are:

–better qualified teacher training
–smaller classes
–more individualized and diagnostic teaching methods
–more school psychologists
–preventive measures (including early screening)
–more parent involvement
–extended public and private services

How necessary such changes and improvements are, may be seen by the merely quantitative consideration that Germany has 0.6 percent handicapped but approximately 10 percent learning-disabled children. It would be nearly impossible—and should be unnecessary—to describe the needs of these children, their parents, and their teachers, in qualitative terms.

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Dyslexia in English Independent Systems

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September in England not only brings the start of the "season of mists and mellow fruitfulness," but also the commencement of the school year. This event is met with mixed feelings on the part of the pupils who participate in it—pride, joy, apprehension and loathing and terror—depending on the relationship with the school and success or failure in acquiring the learning deemed necessary for a future occupation and position in life. The Education Act requires a child to be at school from 5 years of age until he is 16 years old, and it is for at least this period of time that a number of parents strain their financial resources to the utmost to provide an alternative education for their offspring other than that which is provided by the State.

This alternative education is undertaken for a number of reasons:

1. It is tradition within the family.
2. The parent says, "I want a better education for my child than I had" or "I want to give him more than I had."
3. Oneupmanship—"Mrs. Jones does it."
4. A genuine desire to give the best traditional education as an investment for life.
5. The opportunity to take advantage of much smaller classes with more individual attention.

This latter is the one I wish to talk about today.

In England we are still uncertain and experiencing controversy regarding our provision for education. Children enter primary school in the term in which they are 5 years of age, proceed through junior school and then, at 11 years of age, they go on to secondary education—the type depending on the

This paper was presented to the International Symposium on Dyslexia, 27th Annual National Conference of The Orton Society, in New York City, November 1976.

area in which they live. It can be grammar school, secondary modern, or comprehensive school. Three out of four children in England go to Comprehensive schools. There are now fewer than 500 grammar schools, whereas in 1965 there were 1,300. "Comprehensive" may mean a school of 1,200 to 2,000 or more children, with as many as eight "streams," including a remedial one. It is at this stage, if a child has been failing, that the withdrawal from the state system can and may occur.

We have two separate pictures here and, therefore, two separate problems. Independent schools fall into two age ranges: (1) the preparatory school, which usually takes children from 8 years of age and prepares them at 13 years for admission to the secondary school of their choice or admissibility; and (2) the secondary school where they will remain from 13–16 years of age, or more likely to 18 years, prior to possibly going to an university or some other form of further education.

It can now be seen that a child who is 11 years old and leaving the local authority state school can be at a disadvantage in having to catch up with what may be a different situation in learning than that previously experienced. Since the formation of local dyslexia associations and the greater awareness of these pitfalls of transition, more and more parents are seeking advice about assessment and counseling regarding the placement of their children.

Role of the Bath Association

During the past ten years of being actively engaged in the assessment of dyslexic children, I have watched the age floor become lower and the ceiling higher. Originally the approach was from the parents of the child who had failed "11+" selection or Common Entrance at 13. Now we see children as early as 7 years of age and there is no upper limit to age. So we have parents looking for independent elementary schools for their 8-year old children and hoping the children will have the opportunity to make up the educational deficiencies already present and be given the required remedial instruction. Where there is a need there comes the interest in attempting to meet it; it is in the area of the preparatory schools that most help has been given to the dyslexic child in the past.

It soon became obvious, however, that no matter how much help had been given in the preparatory schools this could all be lost without continuity and support on the secondary level, particularly when the pressures of the

"Ordinary Level ("0" level) examinations for the General Certificate of Education loomed for 16-year-olds, followed by Advanced level ("A" level) examinations two years later, with all the accompanying stress and strain of an examination situation. Local dyslexia associations were, and indeed still are, constantly being asked to recommend independent schools which provide appropriate instruction for children affected by dyslexia. It requires knowledge of the individual, the parents, and the school itself to make any recommendations. Although the initiative is the parents', we find more and more independent schools making overtures, thanks in part to a growing awareness of the problem. A number of reasons can be responsible for this interest: (1) schools find they have pupils presenting a problem with which they are unable to deal; (2) teachers who attend dyslexia courses pick up the clues and realize that more could be done within their schools; (3) parents worried about their children's lack of progress ask for an investigation; (4) school medical officers find that children may be referred to them with psychosomatic pains and ailments and realize that a learning problem may be responsible for the constant symptoms present; (5) the independent school has to fight for its survival and cannot afford to turn away students. All these factors may be brought into the open with the help of television and radio programs, items in the press, and the constant stream of information given out by the newly-forming local associations.

Local dyslexia associations and the British Dyslexia Association have played their parts in promoting information about and interest in dyslexia. The formation of the Bath Association in 1966 was followed the next year by the formation of the Scotland and North Surrey Associations. In 1969, the First Introductory Course for Teachers was begun. Without any advertising whatsoever requests came to take teachers into this course, not only from independent schools of high reputation but also from Local Authority teachers. Up until then very few independent schools made provision for dyslexic students, but from then on the demand has increased and is constant. A well-respected, rather progressive secondary school, Millsfield, was one of the first to establish remedial and supportive programmes for dyslexic students of high ability and potential.

Now I speak personally about the actual ways in which the dyslexic child may be taught.

I would like to stress that in any schools that we of the British Dyslexia Association deal with the importance of assessment is emphasized. It is unfair to pupil, parent and school, to make treatment recommendations without all

being fully aware of the problems to be overcome, and much co-operation and goodwill has been built up in this area.

Assessment is made by appointment and takes the form of medical, educational, and psychological testing and evaluation.

The individual may be seen at the Center or at the School, depending on which is deemed the most advantageous to the child concerned, but the parents are requested to be present for subsequent discussion if possible. Full information on all aspects is shared with student, parent, and school; support from all areas is encouraged to the utmost. It is seldom that this cooperation is withheld; but if it is, a special point is made to discuss the problem and find out if there are any contributory problems. This may mean also seeing that other members of the teaching staff do not withhold support within the school environment. It is important that the parents should not breathe down the student's or school's neck or show undue anxiety. Furthermore, the students themselves are aided in understanding that everyone is working towards their success, and that they themselves have a major responsibility.

When the recommendations are made:

1) A teacher who has experience in the appropriate remedial techniques may go to the school as a specialist, to give individual instruction to the student concerned. The school itself is encouraged to see that one of its own staff gradually acquires experience.

2) The school may send members of its own staff to courses and build the necessary tuition for the student into the school structure.

3) Special units may be set up within the school itself with more than one member of staff working in it.

4) In some of the preparatory schools a comprehensive language structured program may be adopted and integrated into all subjects demanding written work.

One or two particular schools cater to students between the ages of 9–15 years who have specific learning problems, and their aim is to provide the best all-round education for individuals with specific learning problems. An individual with an average or above average I.Q. who is affected by dyslexia may start to realize his educational potential and discover himself when he is grouped for a period with others who have similar difficulties. It is possible, when certain standards are attained, that these students can move on to another school not so specialized in nature but still able to provide support

where needed. In other schools experienced staff in a separate department—housed in its own building—give remedial tuition.

The number of schools making provision to teach and support the language-disabled student is increasing rapidly, and while one welcomes this and gives all the help and advice possible, there are a few cautionary points which need to be made.

Because of the present scarcity of such schools there is a danger of overloading them. This brings problems of alteration in the existing character of the school, and a working balance is difficult to maintain. It is a situation needing constant awareness. Often it needs only changes in key staff to take place to disrupt the continuity and success of the program.

I would, however, end on a note of hope. If the rate of growth in the number of reputable independent schools making provision for appropriate remedial tuition in the past ten years, is matched over the next ten years, then the outlook for our language-disabled students is much more rosy than it has been.

Learning Disabilities in Minority Adolescents

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Previously, evidence of learning disabilities was reported in minority high school drop-outs, aged 16 to 23 (Tarnopol 1969; Tarnopol 1970). In the present study, seventy 13-year-old "predelinquent" black, seventh-grade students were compared with a control group from the same school on fifteen variables.

It is well known that minority, inner city students tend to have a high delinquency rate as well as low academic achievement. It has been postulated that poor reading and learning skills lead to very frustrating classroom experiences which in turn may foster school drop-out and delinquent behavior. The causes of these learning problems in nonretarded students may include one or more of the following well known possibilities adapted from a listing in Tarnopol and Tarnopol (1976).

1. Deficiencies in educational stimulation during first six years
2. Excessive absences
3. Changing schools too often
4. Lack of environmental motivators
5. Lack of motivation due to emotional factors
6. Defects in teaching
7. Chronic illness or malnourishment
8. Severe hearing or vision losses
9. Brain damage
10. Genetic or congenital specific learning disabilities

The question arises, to what extent do specific learning disabilities contribute to the learning problems in the minority, inner-city population? In this paper and in the delinquency study cited, an attempt has been made to determine the extent and types of some of the specific learning disabilities operating in this population. In the previous study, deficits in reading and in the visual-motor learning modalities were found. In the present study, more variables have been investigated including auditory perception. Presumably, better understanding of these factors could lead to improved teaching.

Silver (1961) and Silver and Hagin (1967) reported a longitudinal study of specific reading disabilities among their clients at New York University's Bellevue Medical Center, and patients seen in private practice in psychiatry and psychology over a fifteen-year period. They stated that the children at Bellevue who came from disadvantaged backgrounds and the private patients from the upper-middle class tended to exhibit similar perceptual and neurological symptoms. About 90 percent of the children with specific reading disabilities were found to have perceptual deficits when compared with a control group. Ninety-two percent of a group of 150 children 8 to 14 years of age exhibited visual-motor deficits on the Bender Visual Motor Gestalt Test, and 92 percent were unable to copy the designs on the Marble Board Test. Eighty percent were deficient on the Draw-A-Person Test, and over 50 percent demonstrated problems on tests of auditory perception. It was suggested that as new methods of testing auditory perception are devised, this percentage might increase.

Cohen (1967) reported on the reading disabilities in black lower-socio-economic children in a disadvantaged section of New York City. He found that of 626 children tested in grade 3.5, 81.3 percent were reading below grade level; and of 138 who were still in school in grade 8.5, 71 percent were reading below grade level. A sample of the first-graders who were reading below grade level were tested with the Frostig Developmental Test of Visual Perception. Forty percent were found to be severely dysfunctioning on this test. A pilot study using the Frostig, Bender and the Stanford Binet tests revealed that the Form Constancy subtest of the Frostig had the highest correlation with reading for these children. It was also found that most of these disadvantaged children are sight readers. "Over 50 percent of junior high school pupils in one slum school district did not know the alphabet. Most elementary school disadvantaged children cannot blend sounds." In tests of auditory discrimination, it was found that these children almost

always missed ending consonants, beginning blends, ending blends, and medial vowel sounds.

Jansky and de Hirsch (1972) reported a study of 401 children in two New York lower socioeconomic districts including five public schools. The sample included 170 black children about equally divided between males and females. The children were followed from kindergarten through second grade. The Similarities and Block Design subscales of the Wechsler Intelligence Scale for Children were administered giving mean scaled scores of 11.3 and 9.3 respectively, indicating an average IQ of about 100. Nevertheless, at the end of the second grade, 41 percent of the girls and 63 percent of the boys were failing in reading. The authors state, "These children were truly low achievers; most of them could not read a single sentence." On a kindergarten screening battery which predicted the failing readers with 77 percent accuracy, the tests with the best predictive efficiency were, in order of contribution; Letter Naming, Picture Naming, Gates Word Matching, Bender Visual Motor Gestalt, and Binet's Sentence Memory. When teacher competency (ratings by principals) was correlated with silent reading scores for 318 pupils from mixed ethnic groups, the coefficient of correlation was 0.24.

Population Studied

The experimental group (X-group) in the study reported here was screened from the 300 seventh-grade pupils at a San Francisco junior high school with 94 percent black students. One hundred and four pupils were found who met at least one of the criteria for admission to this study. These criteria included; delinquency, ward of the court, dependent of the court, or severe behavior problems at school. Seventy pupils (52 boys and 28 girls) received their parents' consent to participate in this project which included a reading program based on behavior modification, a cultural development program, a group process program, and research and evaluation. This paper will discuss only the results of educational, and sensory-learning-modalities testing.

Since the tests used do not have separate norms for the black, lower socioeconomic population, a control group (C-group) was used for comparison purposes. The control group consisted of 30 pupils from the seventh grade of the same junior high school who had no delinquency record or court connections, and who were considered by the dean of students to be adequately behaved.

School Environment

Those who have worked in inner city junior high schools will be familiar with the environment of this school. The building is a typical massive, rectangular, three-story, stone-faced city school. All of the street level windows had been broken and replaced by plywood. All except one of the entrances to the building were padlocked for security reasons. When the classes were in session, all of the classroom doors were locked from the inside. Each door had a small window through which a person would be observed before being permitted to enter a classroom. Strict security measures were felt necessary to prevent outsiders from entering the classrooms. After a room had been fire-bombed, all classrooms were locked.

Observation of a class in session might give the following picture. In the room would be a teacher and 15 to 20 students. About half of these students would sit at the front of the room and would be working on the lesson with the teacher. The remainder of the students would sit relatively quietly at the rear of the room, either playing a game, listening to their portable transistor radios, or resting comfortably. As long as they did not bother the teacher and the working students, they would be permitted to while away their days. In this general atmosphere, the educational process could hardly be expected to be "normal."

Variables Studied

The pupils who were studied were all in the seventh grade and averaged about 13 years of age. Sixth grade test results were obtained from their records including the Lorge-Thorndike Intelligence (Verbal, Nonverbal, and Total) test scores; and the Reading Comprehension and Vocabulary scores from the Comprehensive Test of Basic Skills. In the seventh grade, the following scores were also obtained from the pupils' records: total grade-point-average, English grades, and the unsatisfactory citizenship grades recorded on their report cards.

The following individual tests were given to both the X-group and C-group pupils in the seventh grade by the research team: Gilmore Oral Reading Test,* Bender Visual Motor Gestalt Test, Draw-A-Man Test, Peabody Picture Vocabulary Test, Wepman Auditory Discrimination Test, Goldman-

*The Gilmore Oral Reading tests were done under the direction of Dr. Robert Bradfield of San Francisco State University.

Fristoe-Woodcock Auditory Discrimination Tests, Auditory Closure Subtest of the Illinois Test of Psycholinguistic Abilities (ITPA), and a screening pure-tone hearing test.**

Results

IQ Tests

No attempt was made to measure intelligence, as such; rather all tests were used diagnostically to determine the nature of the learning problems faced by a disadvantaged population.

On the various intelligence tests, the experimental group (predelinquent pupils) averaged about 83 IQ while the control group (adequately-behaved pupils) averaged about 100 IQ (Table 1). The Lorge-Thorndike Verbal, Nonverbal and total IQ scores were derived from group tests in the sixth grade whereas the Draw-A-Man and Peabody Picture Vocabulary IQ scores were obtained from individual tests given in the seventh grade. The group averages remained about the same on all tests. All differences between the group test scores were significant at better than the 0.001 level of probability.

Grade-Point-Averages and Citizenship

The total grade-point-averages and the English grades were also significantly different for the two groups. The mean X-group average of 1.75 was equivalent to about a C− while the control group average of 3.2 was above a B grade. Twenty-five percent of the X-group received no unsatisfactory citizenship marks on their report cards compared with 93 percent of the C-group.

Reading Tests

In the sixth grade, the C-group was significantly ahead of the X-group on group reading and vocabulary tests. The mean reading and vocabulary grade level of the C-group was about 5.6 with the X-group at 3.35 (Table 2).

**The Goldman-Fristoe-Woodcock Auditory Discriminatory Tests, the Auditory Closure Test and the screening pure tone hearing tests were done under the direction of Dr. Stanford Lamb of San Francisco State University.

Table 1. Scores on Peabody Picture Vocabulary Test (PPVT) and Draw-A-Man Test (in the Seventh Grade) and Lorge-Thorndike Intelligence Test (in Sixth Grade)

Draw-A-Man	*N*	*Mean IQ*	*Standard Deviation*	*Critical Ratio*	*p*
X-group	70	84	13.4	5.9	<0.001
C-group	30	101	12.9		
PPVT					
X-group	70	80	12.5	4.9	<0.001
C-group	30	96	15.9		
L-T Verbal					
X-group	53	93	9.5	5.2	<0.001
C-group	25	100	15.1		
L-T Nonverbal					
X-group	53	83	8.6	3.9	<0.001
C-group	25	97	17.8		
L-T Total					
X-group	53	83	8.6	6.0	<0.001
C-group	25	101	14.3		

Table 2. Comprehensive Test of Basic Skills: Scores for 48 X-group and 25 C-group Sixth Grade Pupils

	Grade Level Mean	*Standard Deviation*	*Critical Ratio*	*p*
Reading Comprehension				
X-group	3.2	1.4	4.9	<0.001
C-group	5.8	2.5		
Vocabulary				
X-group	3.5	1.1	4.5	<0.001
C-group	5.4	2.0		

Hearing Test

On the screening pure-tone hearing test which was administered to 59 experimental subjects and 16 controls, three experimental subjects failed the screening test and were recommended for follow-up testing.

Visual Motor Test

On the Bender Visual Motor Gestalt Test, the C-group did significantly better than the X-group, with age equivalents of 9.5 and 7.5 years respectively (Table 3).

Auditory Perception Tests

On the Wepman Auditory Discrimination Test the X-group averaged 5.5 errors while the C-group averaged 3.6 errors, the difference being significant at better than the 5 percent level of probability (Table 4). On the Goldman-Fristoe-Woodcock Tests of Auditory Discrimination there was no significant difference between the scores for the two groups. This may have been related to the fact that the test age-ceiling was too low. On the Auditory Closure Subtest of the ITPA, the C-group exceeded the X-group at better than the 0.02 level of probability.

The word pairs that the experimental group pupils had difficulty distinguishing included the following: sheaf-sheath, 74 percent wrong; pen-pin, 70 percent; vow-thou, 43 percent; clothe-clove, 36 percent; bum-bomb, 34 percent; fie-thigh, 31 percent; tub-tug, 23 percent; and pat-pet, 21 percent.

Table 3. Bender Visual Motor Gestalt Test Scores for 70 X-group and 30 C-group Seventh-Grade Pupils

Bender	*Mean Score**	*Age Equivalent (years)*	*Standard Deviation*	*Critical Ratio*	*p*
X-group	5.1	7.5	3.1	6.8	<0.001
C-group	1.7	9.5	1.8		

*A score of zero is equivalent to 11 years, Koppitz scoring.

Table 4. Wepman Auditory Discrimination Test, Auditory Closure Subtest of the Illinois Test of Psycholinguistic Abilities, and Goldman-Fristoe-Woodcock Tests of Auditory Discrimination

Wepman	*N*	*Mean*	*p*
X-group	70	5.4 errors	<0.05
C-group	30	4.5 errors	
G-F-W Quiet*			
X-group	55	1.8 errors	<0.1
C-group	16	1.3 errors	
G-F-W Noise*			
X-group	55	10.9 errors	<0.1
C-group	16	10.6 errors	
Auditory Closure			
X-group	57	15.8	<0.02
C-group	16	18.9	

*G-F-W quiet means the auditory discrimination tape did not have any background noise. G-F-W noise means the tape contained background noise. The pupils went through the ceiling on these tests so that the tests did not discriminate.

Oral Reading

The Gilmore Oral Reading Tests were given to 77 X-group pupils only. In the seventh grade, their reading levels averaged 3.7 for accuracy and 5.2 for comprehension. A retest for reliability after one month showed average increases of 0.46 grade level in accuracy and 1.76 grade levels in comprehension for the 16 students retested. These 16 pupils were not in the special reading program during this time.

Correlation Matrix

The Peabody Picture Vocabulary Test was found to correlate well with all other measures used (Table 5). The Wepman Auditory Discrimination Test, on the other hand, correlated with almost none of the measures. The highest correlations between different tests were found for the Comprehension subtest of the Comprehensive Test of Basic Skills (CTBS) vs. the Lorge-Thorndike Tests and the Peabody Picture Vocabulary Test (PPVT),

Table 5. Correlation Matrix. Total X-group and C-group (Coefficients X100)

	PPVT	*Draw-A-Man*	*Gilmore Accuracy*	*Gilmore Comprehension*	*Wepman*	*CTBS Comprehension*	*L-T Verbal*	*L-T Nonverbal*	*L-T Total*	*GPA 7-grade*	*Auditory Closure*	*CFW Noise*	*U's 7-grade*	*GFW Quiet*
Bender	−42	−54			24	−37	−37	−40	−47	−30		29		43
PPVT		35	48	43	−22	70	59	55	64	52	42	−37	−29	−43
Draw-A-Man						24	24	37	37	41			−41	
Gilmore Accuracy				55		58	46		46		29	33		
Gilmore Comprehension					−28	37	53		51	24	41	−27		
Wepman														
CTBS Comprehension							79	68	78	54	39	−42	−27	
L-T Verbal								71	92	57	48	−32	−29	−33
L-T Nonverbal									92	47	44			
L-T Total										57	50	−37	−22	−44
GPA 7-Grade											32		−71	−26
GFW Noise														31

Probability levels: plain type <0.05, *italics* < 0.01, **bold face** <0.001

Abbreviations: L-T is Lorge-Thorndike Intelligence Test; CTBS is Comprehensive Test of Basic Skills; GPA is grade-point-average; GFW is Goldman-Fristoe-Woodcock Auditory Discrimination; U is unsatisfactory citizenship.

NOTE: The Gilmore tests were taken by only the X-group.

with coefficients of correlation 0.79, 0.68, 0.78 and 0.70 respectively. The many negative correlations are due to the fact that some variables such as Bender scores become more abnormal as they increase. The correlations are all in the correct directions.

Both the Lorge-Thorndike Verbal and Nonverbal test scores correlated 0.92 with the L-T total scores. On the other hand, the lower 0.71 correlation between the Verbal and Nonverbal tests indicates that to some extent they measure something different. Since the L-T total scores included the part scores, these results were to be expected.

The Bender Visual Motor Gestalt test correlated well with most other measures indicating that this visual-motor test, which was found to be an important part of the Jansky-deHirsch kindergarten screening battery for predicting reading failure in the second grade, continues to correlate with both reading and grade-point-average in the seventh grade.

The Auditory Closure test of the ITPA correlated well with most tests, especially with the sixth grade Lorge-Thorndike tests. The Draw-A-Man test correlated well with a number of other measures, especially grade-point-average and unsatisfactory citizenship grades.

Medical Examinations

Pediatric examinations revealed no acute or chronic problems requiring medical attention. A few cases were found requiring further optometric examination for possible glasses. This generally favorable condition may have resulted from the fact that a free clinic had been operating in this neighborhood for several years.

A group of interns had been trained to perform the neurological examinations and about six months elapsed after their training so that a new group of interns took over their jobs. Unfortunately, we were unable to arrange for the training of the new interns. The neurological examinations for "soft signs" had to be discarded since the interns who attempted to perform these tests were untrained and the data were found to be worthless.

Discussion of Results

IQ Tests

The major value of IQ tests, as with all tests of a learning-disabled population, is to help determine the strengths and weaknesses of each pupil in

order to develop individualized teaching programs. Lorge-Thorndike Intelligence Test scores were available in the pupils' school records and supplementary scores were obtained from the Peabody Picture Vocabulary Test and the Draw-A-Man Test.

From these tests it was found that the predelinquent pupils had an average IQ of about 83 while the children selected by the dean as adequately behaved had an average IQ of about 100. In all cases, the control group did significantly better than the experimental group ($p < 0.001$), indicating a relationship between learning (and possibly ability to learn), (at least as shown in this group-administered paper-and-pencil test) and behavior. From the correlation matrix, we see that all of the verbal intelligence tests correlated well with almost all other tests, and they correlated especially well with grade-point-average. The Lorge-Thorndike Verbal and total scores (sixth grade) correlated 0.57 with seventh grade, grade-point-averages. Similarly, the Peabody Picture Vocabulary Test correlated 0.52 with grade-point-average. These relatively high correlations indicate that verbal ability remains an important factor in school learning for these disadvantaged children, even though it may not reflect their true potential.

Moreover, the importance of verbal ability goes beyond the school situation. In previous research with minority delinquents, it was found that verbal IQ correlated well with such factors as adult arrests ($r = -0.44$), adult convictions ($r = -0.60$), sociometric leader ($r = 0.54$.), juvenile arrests ($r = -0.27$), etc. (Tarnopol 1969, 1970).

Reading Levels

In the sixth grade the average reading level of the experimental group was 3.2 or about 3 years below grade level (Table 2). In the seventh grade, their reading level (accuracy) on an individually administered test averaged 3.7, or about 3.5 years below grade level. At the same time, their comprehension scores on the Gilmore Oral Reading test averaged 5.2, or about two years below grade level. This average difference of 1.5 grade levels between the comprehension and accuracy scores is to be expected when children are reading far below their grade and age levels, and is also characteristic of pupils with specific learning disabilities.

Single reading test scores which are used to establish a base line for the pretest evaluation of a teaching method are not likely to be reliable, especially for handicapped children. It is therefore necessary either to have scores

from an ongoing annual individual testing of the children (at least one previous test to the one used as the base line) or to double-pretest each child. The reliability or equivalence of pretest scores is indicated by the results of double-pretesting 16 pupils with the Gilmore Oral Reading Test. The mean changes in accuracy and comprehension were +0.46 and +1.76 grade levels respectively in about one month during which the pupils received no special reading help. This point is stressed because it has been observed that a great many reading programs ahve been and are being evaluated by a single pretest score followed by posttesting.

Bender Visual Motor Gestalt Test

The Bender Visual Motor Gestalt Test has been found to distinguish good from poor readers in the primary grades, and has also been found to be a good predictor of reading failure when given in kindergarten (Silver 1961; de Hirsch et al. 1966). In our study the average Bender scores were significantly different for the X-group and C-group ($p < 0.001$) (Table 3). The Bender scores were also found to correlate significantly with most other variables (Table 5). The Bender scores correlated best with the Draw-A-Man IQ ($r = -0.54$), Lorge-Thorndike Total IQ ($r = -0.47$), and the Peabody Picture Vocabulary Test IQ ($r = -0.37$). These correlations are all negative because high scores on the Bender indicate more errors than lower scores. Lack of correlation with the Gilmore Oral Reading Test scores was probably due to the fact that the C-group were not given the Gilmore test so that the range of scores was restricted. The Bender tends to correlate well with most learning measures and with most other sensory processes, especially in younger children. The fact that the Bender scores still appear as a significant variable at age 13 seems to indicate lack of maturity in the visual-motor functions involved in copying these geometrical designs. This assumption is reinforced by the fact that the Draw-A-Man scores also correlated well with most of the variables. The low Draw-A-Man scores seem to indicate both visual-motor and body-image problems in the experimental group (Table 1).

Tests of Auditory Perception

The Wepman Auditory Discrimination Test (1958 edition) differentiated the X-group from the C-group at about the minimum acceptable probability level ($p < 0.05$) (Table 4). Also, it correlated with only a few variables, with

minimal correlations, the highest being with Gilmore Reading Comprehension ($r = -.28$) (Table 5). Some of the word pairs which the X-group pupils had difficulty distinguishing may not have been familiar to these children, and so would be more difficult for them to distinguish than for children who were familiar with the words (examples are: sheaf-sheath, vow-thou, clothe-clove, fie-thigh). In the case of "pen-pin" both a pen and a pin are pronounced pin by these children (and apparently by many other people as well). It has been suggested that people tend to be unaware of sounds which are not part of their normal speech patterns. All of these factors have been suggested as reasons that the experimental group had difficulty with this test. The question still remains, how many have real auditory-perceptual disabilities?

The Wepman (1958 edition) test has some liabilities which should be mentioned. The test has no norms, it cannot be given in a truly standardized manner, and it does not correlate well with other test criteria (indicating a lack of validity). Keir (1977) has pointed out that both the stimulus quality and intensity are uncontrolled when this test is given by different testers who may differ widely in their articulation, accent, and intonation patterns. Thus, he continues, it is not surprising that reliable and valid results cannot be obtained and contradictory conclusions may be drawn from different published studies Using an audiological speech discrimination test Keir tested 41 children who had been sent to him for audiologic testing because they had had poor scores on the Wepman. He stated, "Of the 41 children thought to have speech discrimination problems on the basis of their poor scores on the Wepman test, only one child did have such problems."

On the Goldman-Fristoe-Woodcock Tests of Auditory Discrimination no significant difference was found between the experimental and control groups on either the test with no background noise (quiet test) or the test with background noise ($p < 0.1$). Dr. Lamb, who was in charge of this testing, concluded that the 13-year-old pupils had gone through the test ceiling, and therefore were too old for this test.

On the Auditory Closure Subtest of the ITPA, the controls did significantly better than the experimental subjects ($p < 0.02$). Keir (1977) tested 45 children with learning problems using his auditory gestalt (closure) test. In this test the fragmented words were presented binaurally at 40 decibels above each child's measured speech reception threshold, with several different degrees of fragmentation electronically controlled. Ten children failed this test and none of these children was able to cope with even the simplest

phonic synthesis (blending). These children were 6 and 7 years of age. The other thirty-five children were all able to cope with phonic synthesis at some level. Admittedly, the ITPA subtest of Auditory Closure lacks the sophistication of Keir's test; however, the indications are that inability to close on fragmented speech may be related to blending difficulties in phonic reading methods. Cohen (1967) noted that lower socioeconomic black children tend to be sight readers, often with auditory discrimination and blending problems.* McMenemy (1969) noted that the auditory-perception skills of disadvantaged youngsters are in need of a great deal of work.

The X-group's mean score of 15.8 on the Auditory Closure test is equivalent to a perceptual age of 5 years, 6 months. This very low average-score for 13-year-old pupils may partly be accounted for by dialect differences. However, some of it is probably due to real problems of auditory closure (auditory perception). At any rate, regardless of the origin of the problem, it may be related to the severe blending-disability which teachers tell us they find in this population, and which Cohen, McMenemy and others have also found. On the other hand, some junior high school remedial teachers who are using a multisensory method, and who devote more than the usual amount of time to teaching reading seem to be having some success in overcoming the blending problem. These teachers also conduct well-organized, structured programs and classrooms which have been found to get positive results with pupils with learning problems.

Conclusions

We have tested disadvantaged populations at ages 5, 13, and 16–23, with somewhat similar results (Lamb 1969; Tarnopol 1969, 1970). Visual-motor and auditory-perceptual deficits have been found in a syndrome of learning-related problems similar to those reported by others previously mentioned. This evidence seems to indicate that these disadvantaged students do not automatically mature out of their visual-motor, auditory-perceptual, and learning problems.

*Cohen did not indicate *how* the auditory skills basic to phonics had been taught—a most important factor in the validity of judgment about the characteristics of the population in question.

—Ed.

It appears that it would be appropriate to screen disadvantaged children for learning-related immaturities at the earliest possible age, and to institute habilitation immediately. Experience with Head Start and other pre-school programs seem to indicate that "the results of remedial programs for older children have been disappointing" (Jansky et al. 1972). There is some evidence that programs that are directed towards both mother and child, and start at the earliest possible age (in some cases prenatally to help the mother both accept and nurture the child), show some promise of avoiding learning disabilities (Lambie and Weikert 1970; Garber 1975).

We have seen teachers using both Gillingham-Stillman and Slingerland methods with small groups of minority children in special education classes with apparent success. These classes were in both elementary and junior high schools. Both methods are characterized by structured daily lesson plans emphasizing a total language arts approach.

Our experience indicates that the best environment for learning reading, writing, spelling and arithmetic is the well-organized and structured classroom. A survey of remedial teaching experts in 19 countries brought unanimous agreement on this point (Tarnopol and Tarnopol 1976). This concept is further emphasized by a Stanford Research Institute evaluation of special teaching programs in 36 school districts throughout the nation. It was found that, "In both the first and third grades, the tendency is for higher reading and mathematics scores to be associated with variables which describe the more structured, teacher-initiated classrooms" (Stallings and Kaskowitz 1974).

Reducing external stimuli to a minimum improves the attention span of these pupils immensely. Rooms with wall-to-wall carpeting, adequate sound insulation, minimum visual stimuli, study carrels, adequate lighting and a controlled temperature (about 68° in winter) seem to maximize attention span. This improvement may be related to the general finding that pupils with visual-motor and auditory-perceptual deficits tend to have difficulty processing information and learning in the presence of visual or auditory distractions.

Whatever the complex of specific causes of the learning difficulties which beset many children in the disadvantaged segments of our population, it seems reasonable to expect that appropriate educational measures such as those we have suggested could prove a positive force in improving the children's current functioning and future prospects. This would serve the causes of both simple justice to them and the general economic and social well-being of their communities.

Summary

Seventy "predelinquent" disadvantaged seventh-grade students and 30 controls were compared on fifteen variables. It was found that the experimental group was significantly behind the controls in reading, grade-point-average, IQ test scores (verbal and nonverbal), as well as on measures of visual-motor and auditory perceptual functioning. It appears that the experimental youngsters display a syndrome usually considered to evidence specific learning disabilities. However, in this type of population it is difficult to separate the effects of environmentally determined deficits from inherent deficits. Therefore, it was not possible to estimate the incidence of true specific learning disabilities. On the other hand, it was suggested that regardless of the etiology of the deficits, these children could profit from the same types of educational opportunities as have been found well-suited to aid children with learning disabilities.

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Teaching "The Language as It Is"

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The Orton Society's maxim—to teach the language as it is to the child as he or she is—is so simple and sensible that the years of research and endeavor that must have preceded the formulation of the maxim may not always be appreciated. It represents the starting point for the task that has to be undertaken by those who would lead children to know and understand how to cope well and confidently with their own language. It is as appropriate in the classroom, in the adult education center, in the remedial situation, and for foreign students as it is for those who have special learning problems or disabilities in learning their mother-tongue.

At the 1973 Conference of the Orton Society, Margaret Rawson[23] discussed the maxim in these words:

> It has almost become a cliché to say, "Let us teach the language as it is to the child as he is." Actually, this is not such a bad thing to have happen—in fact, it is just what we wanted, for we were giving shape to a principle and are glad that the shape caught on.
>
> *Teach*—we've been concentrating on this from the early days of the collaboration of Dr. Samuel T. Orton, the physician; Anna Gillingham, the psychologist; and Bessie Stillman, the teacher.
>
> *The language as it is* is another old concept, but with much new data and understanding added from the discipline of linguistics.
>
> *To the child as he is:* this also has been based soundly in the disciplines that describe the neurophysiological and psychological structure and functioning of the human being, with a whole host of new information and some very exciting breakthroughs in learning theory and in brain science. We have learned in these various disciplines, too, to individualize children's capacities and needs better and better, and so

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This article has been condensed from a paper prepared for The Orton Society's International Symposium on Dyslexia, in New York City, 1976.

maybe we are doing a better job of tailor-made education—live, exciting *education*—as well as training and skill development."

Since so much has already been learned and written about *the child as he is*—about the learner and how to understand his universal and special needs—I shall focus this paper especially on the nature of the English language, which the child must learn, and on some effective ways to simplify its teaching which are consistent with its structure.

We know from research studies, as well as personal observation of individual children, and we accept as basic that: each hears in his own individual way; each sees in his own individual way; each matures, develops and progresses in his own way, and at his own rate.

As we look analytically at the language the child is to learn, we find words—words that are made of sounds and letters—and we formulate our findings thus: when we listen to words, we hear sounds; when we speak, we say sounds; when we write, we put down letters for sounds in the words; when we read, we see letters, and we say sounds for the letters—that is:*words are made of sounds, and sounds are written with letters.*

This very brief summary suggests that the prime task of the language teacher, whether it be in the classroom or a special teaching situation, is to lead the pupils both to understand and to know sounds and letters, and the order and pattern of letters which stand for sounds in printed words. When the child has this understanding—hearing, seeing, maturing, developing and progressing in his own way as an individual—he will use this essential, basic knowledge to meet his particular needs as he listens, speaks, writes, and reads in the course of his everyday activities. The proposition thus briefly stated seems so simple that one wonders why there needs to have been dissatisfaction with the results of English language teaching over the years.

Many factors exert their influences on teaching, learning and achievement. One that seems to have hampered the resolution of problems associated with English language study in the past has been the attitude of native speakers who customarily regard both the language and the pupils as variables. While it is generally accepted, at least in theory, that pupils are variable, a case can be made for recognizing the language as a constant. Research on phoneme/grapheme (sound/letter) correspondences has shown systematic regularities by which this constancy can be established. And yet, because methods of teaching are substantially influenced by deeply entrenched attitudes toward the English language, even methods based on "phonics princi-

ples" tend to present their material along traditional lines, so that it seems they are still trying to resolve the problem in terms of two variables.

However, when phoneme/grapheme correspondences are assessed and interpreted according to the realities of the language and the needs of the learner, and not according to traditional attitudes, the way in which the language can be established as the constant becomes clear. It also becomes apparent that a new attitude toward the English language and a new way of introducing it to students at all levels are needed and possible.

An attitude has been defined[24] as, "a relatively enduring organization of beliefs around an object or a situation, predisposing one to respond in some preferential manner." It is not easy to discard established attitudes and adopt new ones; evidence presented to justify change must be exceptionally convincing. Accordingly, this paper presents evidence to support the consideration of a new attitude toward the English language, one which derives principally from its use of phoneme/grapheme relationships.

Attitudes and methods related to language teaching in the past will be looked at in *retrospect*. The potential of phoneme/grapheme correspondence studies will be considered in *prospect*. And, finally, a new attitude toward English and its teaching will be outlined in *change*.

Retrospect

We shall review, briefly, some of the traditional attitudes which have exerted a strong effect on the teaching of English at the elementary level during the past hundred years or so, but before doing this, I should like to mention the challenging experience which led me to consider the need for change in these attitudes.

In the early 1950's I found myself teaching English to migrants to Australia from non-English-speaking countries. These foreign students presented a unique opportunity to evaluate our methods through the eyes of many well-educated, highly-motivated adults who had already studied, learned and mastered a language (their own) but who were beginning students of English. They were mature; they remembered their earlier schooling; and they were critical of our customary ways of teaching which did not give them the knowledge and understanding they needed to become confident users of the new language.

Because of their past experience in language study, they were able to point out defects and deficiencies in English language teaching as under-

achieving native-speakers could not do. Their special criticism was that traditional methods did not establish the understanding of the relationship between the spoken and the written word which they regarded as basic to their mastery of the language. They said, "We can speak; we can read English; but we don't *know* English!"

Foreign scholars have also commented on this point, as when Friedrich [11] wrote: "Have the well-known English love for tradition and passion for individuality really brought about a situation in which, in contrast to all the other European languages, English affords no means of establishing a link between spelling and pronunciation to make the task easier for the learner?"

The foreign students brought textbooks to me and asked me to explain them. As I read these familiar books through the eyes of those who were striving to learn from them, I began to recognize how inadequate and unsatisfactory many of them were for the purpose for which they had been written. At the time I was also working with underachieving English-speaking children and adults, and gradually I learned that they, too, did not *know* English; despite superficial appearances, they were uncertain, in varying degrees, in all situations in which words were used.

These experiences with students led me to undertake an extensive reading program directed primarily toward finding books to recommend to foreign students. The study ultimately extended into the literature concerning the nature of my own language and methods of teaching it at the elementary level to English-speaking children during the last one hundred years. I thus gathered evidence showing that a fundamental change of attitude was needed.

Especially relevant to this paper was the observation that four factors in particular have been adversely affecting the teaching of English to generations of children:

1. The traditional attitude of regarding English as irregular.
2. The teaching of spelling and reading as unrelated subjects.
3. The cultural inbreeding of ideas about English language teaching.
4. The lack of a unified concept of what the learner needs to know and understand about the language to ensure that he will get started and continue with confidence on the road to literacy.

1. Irregularity of English Spelling

To appreciate the significance of this point one needs to go back over a hundred years to the time when free and compulsory education was intro-

duced in English-speaking countries. At that time scholarly discussion about irregular spelling and demands for spelling reform occupied the attention of the public, the press, and the Parliament of the United Kingdom.[17] This indirectly, and perhaps unwittingly, influenced the development of the teaching of English at a very important time. There were other influences, of course, but it seems to me that they are less important than the often unrecognized influence of feelings about irregular spelling.

The unanimity of English writers (too numerous to cite here) on the irregularities of English, and the lack of evidence to support their contentions, were the major factors which led me to carry out a research project in the early 1960's. I felt I must find out whether English spelling was, in fact, as irregular as everyone appeared to assume.

It seemed that one had to consult books written by foreign scholars to find an intimation of order and pattern in English words, and of the way in which they might be studied systematically.

For instance, Wijk[29] states:

> English is not as difficult as most people are apt to think. When we come to examine the question more closely, we shall find that this impression is very largely wrong, for the vast majority of English words—about 90–95 percent of the total vocabulary—do in fact follow certain patterns in regard to their spelling and pronunciation. It is therefore worthwhile making oneself familiar with them.

And Friedrich[12] says:

> It is rarely one finds in the traditional English dictionaries or grammars anything on the subject of what laws hold good in the matter of spelling and pronunciation. Generally the whole matter is dismissed with the remark that there are no laws, or that they are so complicated that it is not worth while stating them, let alone reducing them to a form in which they might be of practical use. A trained linguist will here point out that the whole problem is in a certain sense an easy one. The key to the question lies in etymology, in the laws which emerge when one studies the development of the English language. This is in principle perfectly true, but the English have been reluctant to set forth these practical laws to make them available for general use.

The emphasis placed on "irregular" English continued to influence the teaching of the language for a long time, and even today methods of teaching

161

are espoused by those who say[26] that "English is not a highly predictable language as far as its spelling and sound relationships are concerned." Generations of children, have been taught on the basis of this false premise. We found no convincing body of evidence to support the contention. Usually a few words (such as COUGH, THOUGH, THROUGH) have been commonly cited to condemn the whole language as irregular. Clearly, it was time to take a fresh look at the assumptions. Recently a different and more accurate picture has been presented.

A major contribution to the debate was made in 1966, with the publication by the U. S. Office of Education of the findings of an extensive program of research carried out at Stanford University, California, under the direction of Dr. Paul Hanna.[16] This report, entitled *Phoneme-Grapheme Correspondences as Cues to Spelling Improvement* was based on computer analysis of the spellings of some 17,000 common English words. It sets out the orderly patterns of those words, and shows that 84 percent of them can be regarded as "regular" in spelling, and that most of the rest can also be studied in an orderly manner. Only about 3 percent can be regarded as "spelling demons," with usually only one sound/spelling being "demonic". For example, in the word WOMEN, only the letter O, standing for the /i/ sound, is irregular.

Elsewhere, Hanna, Hodges, and Hanna[15] state:

> From linguistics and from contemporary studies of our orthography we have become aware that the view [that spelling is erratic and unpredictable] is exaggerated, that the spelling of our language is for the most part predictable, that it is largely based on patterns or principles, and that a pupil can learn how these principles function . . . [Admittedly] certain words do contain rare, even unique, spellings of phonemes, and such words need to be mastered by whatever means are available to the pupil. But these words hardly constitute a basis for assuming that the entire language is orthographically chaotic, and that most words are spelling problems.

Chomsky[7] has said that conventional English orthography is seen in its essentials as "a near optimal system for representing the spoken language." Chomsky and Halle[8] state, further, that "citation of exceptions is of very little interest. . . . We stress this point because of what seems to us a persistent misrepresentation in linguistic discussions of the significance of exceptions."

2. Teaching Spelling and Reading as Unrelated Subjects

Because of the emphasis that was placed on irregular spelling, what can only be regarded as irregular methods of teaching a language were developed to teach English. In particular, the teaching of spelling and reading as two unrelated subjects, with reliance being placed to a considerable extent on visual and rote learning, has had a serious and adverse effect on the teaching of English. Foreign students in our country compared this peculiar way of learning a language with the way in which they had learned their own languages. For example, children of many foreign language countries do not have to "learn spelling" in the way that English-speaking children have in the past. An eight-year-old Italian boy pictured in an Australian paper said that he wanted to go back to Italy because "you don't have to learn spelling in Italy."

The language itself, not spelling and reading separately, needs to be the focus of instruction. English-speaking children, no less than children of other countries, need to know the elemental facts about their language, so that they can establish the foundation for competence and confidence in using it well in all communication situations.

As Gough[14] says, "Knowledge of the language being read is at the heart of the reading process, and without that knowledge reading could simply not take place." He also points out that when thinking about reading we are apt to overlook the importance of language. Books, journals, and conferences on the subject seem preoccupied with the periphery of the reading process, and so the simplicity of the task that needs to be undertaken is often obscured, if not lost sight of.

3. Cultural Inbreeding of Ideas

The lack of comparative studies of methods of teaching native languages at the elementary level is often deplored. Yet despite the underachievement of many English-speaking individuals over the years, the experience of educators in other language countries does not seem to have been drawn on to any extent, even when it is available, except in relation to some special areas, like dyslexia.

In 1957 the London University's Institute of Education[17] published the results of an inquiry into the question, "Is the irregularity with which English is spelt an important cause of reading difficulty?" The experience of teachers

in countries where the language is spelt more regularly than English was studied in about 30 countries, from Peru to India. Some of the observations made by the investigators are interesting in the context of this paper, although the reporters missed the implications which seem clear to us. It was found that in virtually all countries that use alphabetic writing work begins with the study of the representation of sounds by letters, and that, having learned the elements, one builds syllables and sentences. To us this indicates one way in which traditional attitudes toward English should be questioned, but this was not apparent to the investigators, so colored were their conclusions by their unquestioned belief in the irregularity of English orthography.

George Steiner,[21] in another context, has strongly urged that literature should be taught and interpreted in a comparative way. He considers that it is "academic feudalism that draws sharp lines between the study of English and of other modern languages." It seems to me that his comment about literature might also be applied to the teaching and learning of English at the elementary level.

My work with the educated foreign migrants, as well as my reading of the pedagogical literature, led me to the conclusion that our methods have been to a considerable extent, the outcome of inbreeding of ideas within the English-speaking countries.

4. Lack of Conceptual Background for Teaching Language

Debate and attention are commonly directed toward methodology, but an adequate framework on which methods can be built has been lacking in my country, where the work of Gillingham and her associates and successors is not as well known as it is in the USA. Prator,[22] working in the teaching of English as a second language, states that "Leading methodologists have come to widely divergent conclusions; instead of basing decisions on evidence, they have sought evidence that would provide a rationale in support of preconceived opinions."

I suggest that an appropriate attitude requires an intention on the part of the teacher to lead the student to explore, discover, and understand the elemental facts about the language. This will provide the basis for the development of competence in its use and for his wider, continuing studies. Right from the start, such an approach replaces learning separately to spell and to read "irregular" English. It takes advantage of the newer phoneme/

grapheme correspondence studies [so similar in outcome to the results of Gillingham's earlier scholarship—Ed.]. Most significantly, it is built on a rational conception of the whole area of language study at the elementary level, and—to return to our earlier mathematical analogy—it emphasizes the language as a constant in the instructional process.

Prospect

The Stanford and other studies provide substantial evidence to refute the "irregular English" argument, and to support the development of methods of teaching English as a generally orderly and regular language. There has been criticism of the results of programs of instruction based on these studies, but usually the data reported in criticism are derived from experiments in which either spelling or reading has been taught with focus on the letter patterns (graphemes) rather than speech sounds (phonemes) as both initiating and controlling factors.

In contrast, one of the main thrusts of the Stanford study was to document the dependability of the patterns used in spelling the sounds of English, *beginning with the sounds.* It makes a vital difference which is considered basic. (The Hanna et al.[15] spelling program is one in which sounds are related to letters, as would be expected.)

To those who have worked successfully for many years along the ways defined by Orton, Gillingham, Stillman, and their successors, programs developed in recent years to teach phoneme/grapheme correspondences are hardly new. And yet, the need for a major change in attitude toward elementary instruction in English is still so little recognized that it seems justified, especially in my country, to use the term "New Way" to designate the similar but distinctive way of study which I shall outline here.

This "new way" is based on research which was proceeding in Australia at the same time as the Stanford study; it is similar to, but not the same as, that investigation. For instance, in the Stanford study the words were examined as listed in the dictionary; in the Australian study words were analyzed in three broad categories, according to the development of the language. There has been some discussion and collaboration between the two groups of investigators since about 1970.

The *Concise Oxford Dictionary* was used in the Australian study, and a decision to examine the words in three groups was reached after considera-

tion of a number of references in the literature which indicated that the key to the solution of the problems met in the learning of English lies in its etymology.

Potter's[21] discussion of "the striking incompatibility between the native and the Latin elements of our language" led to the native words' being studied separately from the Latin-and-Greek-derived words. We hoped that we might see areas of compatibility, or some ways of handling words in an orderly manner, as indeed proved to be the case. When words are so divided, an important point of difference is observed. *The vowel sound is the strongest influence on the speaking, writing, and reading of the native words; but the vowel sound generally exerts little or no influence in the words derived from Latin or Greek.*

Some Characteristics of "The New Way"

Some of the features of the so-called new way are seen in other programs which are based on phoneme/grapheme correspondences; but there were other and different influences at work during its development. We need to look at some of the more important common and uncommon features at this point.

The Considerable Order and Regularity in Words Is the Primary Focus of our Attention

It seems that the positive view that English is orderly and regular needs to be stated, even stressed, time and again, especially in the early stages of the presentation of this view. It may seem repetitious, but it must not be lost sight of!

Foreign students and adults attending literacy courses say that they have been handicapped because they have always believed that English is irregular and therefore hard to learn, and some have had their belief confirmed by the instruction they have had. They have often commented on the statement in the foreword to my book[25] setting out this new way that "the book is dedicated to the proposition that it is not hard to learn English if one goes about it in a common-sense way." They say this is the first time they have seen such a statement, and it gives them hope. It might reasonably be assumed that the underachieving child in the classroom or special teaching situation would also gain some confidence from knowing this.

Words Are Grouped and Studied according to the Historical Development of the Language

The three groups in which the words are considered—Early English, Invasion, and Latin-and-Greek-Derived—involve quite different but self-consistent etymological principles, with corresponding differences in sound/letter relationships.

Early English words are regularly spoken, written and read according to two patterns of letters for sounds, to be discussed later in more detail.

Invasion words have come into English from other languages primarily since the days of the Norman Conquest of England in 1066. These include the so-called irregular words, but they, too, can generally be studied in an orderly, logical manner.

Words derived from Latin or Greek are regular and orderly also, but in their own ways. They are written by joining prefixes and suffixes to roots, in a way basically unlike the Early English patterns of letters for sounds.

Hearing, Speaking, Writing and Reading Are Linked in One Study

This provides the multisensory approach used by Orton, Gillingham and others, and advocated by Piaget. Support comes from other sources, also. For example, in an editorial in *Elementary English*[10] in 1974 we find this statement: "All language skills reinforce each other, and no language skill can be taught in isolation. . . . Only an integrated approach to language study will result in effective instruction for children. Trying to teach reading, for example, as a subject apart from listening, speaking and writing, fails to help children see relationships which could result in more effective learning."

Commenting on the low incidence of dyslexia reported among Japanese people, the editor of the *Bulletin of the Orton Society (1975)*[20] said: "We wonder whether educational procedures developed over the centuries (in Japan) have not acted as a fine measure of dyslexia-prevention for mildly or moderately inept language learners. Japanese children customarily study aloud, speaking and hearing as they write and read. This seems exactly the multisensory approach found in the U.S.A. to be an effective program for preventing language learning problems in dyslexia-prone youngsters."

Children of countries with alphabetic languages other than English are usually introduced to their languages through a more or less unified multisensory approach. One wonders what argument can support the continued

separate teaching of spelling and reading in English, especially when the favorable response to the multisensory approach by pupils of all ages is observed by those open to its evidence.

Teaching Links the Spoken and the Written Word

"Leonard Bloomfield," according to Hanna and associates,[16, 15] "first advocated a rather radical departure from traditional attitudes concerning the teaching of reading and spelling. He stressed the need to teach pupils skills of associating spoken language to its written form, rather than the reverse process of [going from] writing into speech," since "the spoken language is basic and original; the written language is secondary and derived."

Belief in irregular English had led to the development of methods of teaching in which these basic considerations were ignored and overlooked and the rational order was reversed.

Pupils Are Taught How to Speak Clearly

Being sure that pupils know how to speak well is important from the first days at school. Speech should not be a separate study, nor is any special manner or style of speaking insisted upon. However, the individual learner has a basic need to recognize and know how to say each of the standard English sounds. Then he can develop with confidence his own manner of speaking to meet his needs, and need no longer be uncertain when he speaks. Gillingham's insistence on a "standard," or dictionary, pronunciation during lessons is an important directive, but is sometimes, according to Childs,[5] a hard one to carry out.

As to varieties of language usage, Hanna has said,[15] "A teacher must face facts—he must first of all teach pupils that there are two patterns of oral expression—one formal, and one informal; and that neither is universally acceptable—the choice depends on time and place. He must also make it clear that written expression normally adheres much more strictly to formal than to informal patterns of expression, and that certain advantages are gained by this. . . . Language must not only have flexibility to live and grow; it must have currency to be understood."

In the 18th century Dr. Samuel Johnson[18] commented that "a double pronunciation—one cursory and colloquial, and the other regular and solemn—has its advantages. The cursory pronunciation is always vague and

uncertain, being made different in different mouths by negligence and unskilfulness and affectation. The solemn pronunciation is yet always less remote from the orthography and less liable to capricious innovation."

Children often need help in understanding why they should learn how to speak more clearly, but students in adult literacy classes are fully aware of the need for instruction in speaking to be an integral part of language study. Many, perhaps most, books and programs written to guide instruction in speaking have been prepared for those who teach speaking separately from writing and reading, and so they are to some extent inadequate. In contrast, "how to speak" is woven through the whole of the plan of study under discussion here.

The Dictionary is Given Its Deserved Central Role in Language Study

Knowing how to use the dictionary to find out other basic facts about words, as well as their meanings, correct spelling, and pronunciation, is an integral part of the plan. Again, underachieving adults have stressed the need for full study of this resource; they feel deprived and hampered when they do not know how to use the dictionary to the full.

Pupils Are Led to Understand That We Speak and Write to Impart Meaning

As the wealth of simple order and pattern in the spelling of words is discovered, an interesting and intellectual view of the elementary study of the English language opens up.

Carol Chomsky[17] presents the positive view of English orthography which has emerged from recent work in phonological theory within transformational grammar when she says, "One of the most important contributions of psycholinguistics to reading, still widely unknown and little appreciated, is a radical consideration of the function and efficiency of English spelling. . . . English spelling is *not* an inadequate system for the representation of sounds, but rather a highly efficient system for representing meanings." Elsewhere[6] she says, "On the lexical level and in the orthography, words that *are* the same *look* the same. . . . The spelling system leads the reader directly to the meaning-bearing items that he needs to identify. . . . It seems also that this abstract lexical level is highly resistant to historical change, and remains the same over long periods of time."

The arguments she advances are as valid for the Early English and

Invasion words of the beginning reader as for the Latin-derived polysyllables she uses as examples. Consider the word *grow*, which conveys a central meaning. Words such as *growth*, *grower*, and *grows* must contain the whole of the little word *grow* to help the reader grasp immediately their main meaning as he would not do if the words were written merely phonetically as *groth*, *groer* and *groes*. (This simplifies language comprehension very considerably, but one must still be flexible enough to recognize *ow* as a long-*o* spelling and to admit *grew* into the company.)

Consider also the words *hopping* and *hoping*. To give the reader the meaning *hopping*, the writer must double the letter *p* to ensure that the reader, who shares his knowledge of this convention, will give a short vowel sound to the vowel letter *o*, say the word correctly to himself, and immediately grasp the intended meaning. The spelling *hoping* would lead to a different sound and meaning. (We shall discuss these patterns in more detail later.)

Students of all ages respond with considerable interest to this aspect of the study. They say writing of words, essays, and letters is more interesting when they know they are using written forms to impart meaning, not merely to "spell correctly." It is *an attitude toward words*, important and lively, and usually neglected when emphasis is placed on the irregularities of English.

In summary, to emphasize the study's central theme:

Words are made of sounds, and sounds are written with letters, in an orderly manner, to impart meaning.

Here, concisely stated, is the concept on which the teaching of the English language can be firmly based.

A New Way of Teaching

The realization of the orderly manner in which sounds are written with letters leads to a new attitude toward the English language and its teaching. In this new way the facts of the language are used to illuminate; they are not forced out of shape to fit a distorted view. A few details will illustrate the approach.

Four cornerstones, or basic principles, which apply to all words, are established with the student, as follows:

1. Remember that words are made of sounds, and sounds are written with letters, in an orderly manner, to impart meaning. (This is basic and cannot be repeated too often.)

2. Say, hear, write, and read each word as it is studied, so each action helps the others.
3. *Write* one letter for each sound, unless a reason is known for writing more than one letter. (The reasons are studied.)
   Say a sound for each letter, unless a reason is known for doing otherwise. (The reasons are studied.)
4. Be sure the whole of a little word is written in a longer word which has the same main meaning, unless there is a reason for not doing so.

Each of the three groups of words already mentioned—Early English, Invasion, Latin-Greek-Derived—is studied separately, because they follow different patterns of structure, based on their different origins. However, the language is a unity, with some mixing of the historical strains, and so the student also explores and relates these to one another so that he may become accustomed to moving freely and knowingly among them as he works toward a mastery of the *whole* language. The paths of his learning are dictated by the subject matter and also by his own needs, capacities and learning pace.

Early English Words

The data on phoneme/grapheme correspondences in Early English words show two primary patterns, emphasizing the relations of vowel and consonant sounds and the letters that represent them. These are referred to as the Long Vowel Pattern and the Short Vowel Pattern and their mastery solves the largest part of the writing and reading problems concerned with the Early English segment of our language.

The Long Vowel Pattern is the one in which the vowel sound is the same as the name of the vowel letter, as in *hope, hoping, hopeful.* In going from the spoken to the written word, writing one letter for each sound, the vowel letter is followed by a single consonant and then another vowel—Vowel-Consonant-Vowel, or V C V—as in *hoping.* Reversing the spelling approach, the reader, who recognizes the V C V pattern, knows to give a long vowel sound to the letter *o* in this same word, *hoping.*

When there is not another vowel sound after the single consonant which follows the long vowel sound, as in *hope* or *hopeful,* a silent vowel letter, *e,* is added after the consonant, and so we have the required V C V pattern. This guides the reader to say the words correctly, and also to grasp their meaning immediately.

According to principle, we write one letter for each sound, unless we

have a reason for adding an extra letter. The reason for adding the *e* in *hope* and *hopeful* is easy to understand and to state: the *e* is needed to show the reader that the vowel is to be given its long sound. There is no reason for putting it in *hoping*, where the Long Vowel Pattern of V C V is completed simply by writing one letter for each sound. The *e* is to be used if it is needed, otherwise why use it?

The Short Vowel Pattern is exemplified in *hop, hops, hopping* and *hunting*. We write one letter for each sound in words of one syllable which contain a Short Vowel Sound, such as *hop, hops*. To point out the Short Vowel Sound in longer words, a pattern different from the one that pointed out the Long Vowel Sound is needed, and so the Short Vowel Pattern is symbolized as V C C V: the Short Vowel Sound is indicated when more than one consonant occurs before the next vowel, as in *hunting*. When there is only one consonant sound after a Short Vowel Sound, the consonant letter must be repeated, or doub'ed, to complete the Short Vowel Pattern of V C C V, as in *hopping*. As we said above, the reader, knowing the pattern, gives the short sound to the *o* and gets *hopping*. He also grasps the meaning and is aware of the difference of this word from *hoping*, with its one *p*.

We write one letter for each sound, unless a reason is known for adding an extra letter. The reason for adding (or doubling) a consonant can be stated simply: Double a consonant only when it is needed as a signal to the reader to give the vowel its short sound.

The fourth basic principle is also followed in writing and reading words according to the two-vowel patterns. The whole of the little word is in the big word that has the same main meaning, unless, for cause, a silent *e* is dropped out. The *grow* words, cited previously, are a good example.

The control of spelling and pronunciation in Early English words centers in the vowel, with the surrounding consonants which affect and indicate its sound value. In addition to the simple relationships, there are some significant subsidiary ones to be studied. A simple example is the use of the letters *i* and *y* for the long and short sounds generally thought of as "the *i* sounds". These are usually written with *i*, except at the end of a word, as in *try*, or when two *i* sounds occur in sequence, as in *trying*, when the first is written *y* and the second *i*.

Similarly, with consonants, we have the use of the letters *c* and *k*. The *k* sound would always have been written with the letter *c* if there had been no invasions of the language, including the Latin-French invasion. Because the letter *c* in these foreign words has the *s* sound in English before the letters *e*,

i, and *y*, the letter *k* is written there in Early English words, and is often used in a sort of "double-*c*", as *ck*.

The examination of phoneme/grapheme correspondences leads to the generalization that the only letters added to words regularly spelt according to the one-sound-one-letter principle are the silent *e* and the doubled consonant. These have a purpose to indicate pronunciation. Their use is an Early English habit, not generally followed in Latin- and Greek-derived words except where the two streams merge, as they do when for example, the Early English ending *-ing* is added to a Latin-Greek word such as *allotting* or *balloting* where the stress patterns influencing the vowel pronunciation as short or schwa (discussed below) reflect one another.

Beginning with this approach to Early English patterns, students find that the understanding of the language system begins to grow upon them. Its rationality for both reading and spelling will continue to influence all of their study, as interest and confidence grow with skill.

Invasion Words

After the Early English words, the next group is that of the Invasion words. This is a smaller, but still considerable, group containing many words in which vowel spelling choices and true irregularities present problems for students. The choice-words, which seem burdensome, nevertheless can be grouped and rationalized to make learning easier, and the study of their history makes them more acceptable. Reduced in this way, the burden is far less than when the spelling of each word requires a separate learning act, as in the "irregular English" frame of reference.

In both Early English and Invasion words there are a few that are now truly irregular, often ones which Chomsky[6], as quoted above, has referred to as resistant to historical change. The Hanna analysis, however, found them to be only about 3 percent of common words, which is a truly helpful reduction of the rote-learning burden.

Latin- and Greek-Derived Words

The largest of the three groups comprises the Latin- and Greek-derived words. These are formed by joining affixes—prefixes or suffixes—to roots, as in *commit, recommend* and *finally*. They do not follow the Early English

patterns of letters for sounds, and the vowel sound has relatively little influence on the writing of these words.

Consonants are not doubled as in Early English words (except as noted above, when the two groups merge). The apparent doubling, as in *commit* and *finally*, is the coincidental result of one consonant, belonging to the prefix or suffix, being the same as the other, which is at the beginning or end of the part of the word to which it is added. When the two consonants are different, or the prefix ends or the suffix begins with a vowel, there is, of course, not even an apparent doubling, as in *comprehendable*.

A study of roots, prefixes, and suffixes is, therefore, necessary to an understanding of these words and how to handle them. Chastian[4] has said (and we agree heartily), "There is a pressing need to provide methods of instruction more responsive to students' intellectual needs." The study of Latin- and Greek-derived words, which forms a part of this New Way, may well be a step toward providing for these needs. In addition to the emphasis on word formation, the study of syllable accent, or stress, makes a contribution to the improvement of speech. It is here, also, that we may profitably discuss briefly that troublesome phenomenon, the schwa sound of vowels. These are among the concepts of importance to everyone who needs to use the English language, but the underachiever and the dyslexic student need especially careful and thorough guidance on these points.

The Schwa Sound

The schwa sound gives trouble in all classes of words, but particularly in those of Latin and Greek origin. It is written in some dictionaries and in the International Phonetic Alphabet as an inverted lower-case *e*—ə—and is referred to as the neutral or indeterminate vowel sound. It is the sound of an unstressed vowel, usually a short one, rather like a "very short *u*," and sometimes called "super-short" by children or "very weak" by those who think of the term's Greek, Hebrew or German origin or verbal relatives. In rapid or poorly articulated speech it may be scarcely audible and in ordinarily clear diction it is still so common as to cause great confusion in all aspects of language, especially for those with poor auditory discrimination who, at the same time, cannot save themselves by accurate visual recall. This, of course, includes a large percentage of those we commonly designate as dyslexic.

The ten-year-old who said that everything that grown-ups, including teachers, said sounded like jumbles of sounds to him and did not make sense,

first led me to look intensively at the schwa sound. When I mentioned the boy's remark at a parents' meeting, a fifteen-year-old girl who was present whispered to her mother, "That's how it always was with me, Mum!" And corroboration has come to me innumerable times since then from many sources.

The unaccented vowel is one of the facts of linguistic life, and it must therefore be thoroughly discussed with and understood by the learner, who must also be given much experience in saying, hearing himself say, writing, and reading words containing this sound. It is as important to teach him to say (and hear) the schwa sound in unaccented syllables as it is for him to know how to write the sound, having thought his way through the word with the help of its etymology. As the sound occurs most commonly in prefixes and suffixes, a study of these elements in relation to the schwa sound is a great help toward knowing how to write it in words.

Summary

When studies of phoneme/grapheme correspondences are interpreted according to the needs of the learner, and are brought into line with the study of alphabetic languages in general, a very simple statement of how to speak, spell, and read English words is possible. We can summarize them this way:

1. The learner needs to understand and accept that words are made of sounds, and that sounds are written with letters in an orderly manner to impart meaning.

2. One letter is written for each sound and one sound is said for each letter in orderly and regular words, comprising most of the language, unless a reason is known for doing otherwise.

3. Two patterns of letter/sound relationships guide the speaking, spelling, and reading of Early English Words, determined by long and short vowels, respectively.

4. Considerable helpful ordering can be given to Invasion Words, whose varieties can be related to the language patterns of their origins.

5. Latin- and Greek-derived words are regularly written by joining prefixes and suffixes to roots.

6. The comparatively small number of truly irregular words or word elements (about 3 percent of all words) must be learned by rote.

Such an understanding of the cultural roots and the structure of the language provides a practical set of tools which is a far cry from F. Smith's [26]

probably impossible and certainly unnecessary "more than 116 rules . . . required to give a child a mastery of phonics." As Gillingham pointed out (see Childs 1968), there is a fundamental difference between teaching the English language and teaching a hodge-podge of rote-learned phonics snippets.

Readers familiar with what is called in the U.S.A. the "Orton-Gillingham approach" will recognize the very great similarity of it and the independently developed "New Way" here described. After all, the language to be learned is the same, and the learners share their human characteristics and the fact of their individual uniqueness, so why should the answers to their needs not be similar?*

Looking Forward

But tradition has enormous inertia, and some forces connected with old, traditional attitudes still oppose the new ways of looking at the language and introducing it to the learner. More knowledge, better practices and more effective communication with the public are still needed.

Some of the work has already been done, of course. There is a large and growing literature, stretching back at least to the 1920's and piling up faster and faster. We find papers and books in scientific background and teaching applications accumulating faster than we can keep up with them.

We are further ahead than we used to be. On the other hand, it is important for each of us unceasingly and persistently to question current practices in both traditional and experimental fields, in the light of new insights into the nature of both our language and its learners and better ways of teaching. If there were space, I should like to raise several questions, for there are many to which I am constantly seeking answers. This questioning is the lifeblood of our growing science and practice.

You, the readers, and I might not agree on our questions, but the very act of questioning makes it more likely that we will not be caught in traditional molds. What we do we shall do for more carefully considered reasons and with more confidence. We shall be open to still newer and better ways to teach the language to the child or older student as we find him. We can hope more and more to be like the boy in J. M. Couper's "The

*The experience of professionals in the field of dyslexia attests the generality of the author's principles in other languages—Germanic, Slavic, Romance, and to some extent, Oriental. Both the problems and the effective solutions, arrived at independently, have a striking amount of common ground. —Ed.

Thundering Good Today"[31] who said, "I don't just want to be literate. I want to be able to *wield* the English language when I grow up!"

That is the spirit for us all!

* * *

[For reasons of space, it was, unfortunately, necessary to condense this paper substantially. The author raised and cogently discussed several pertinent questions of methodology, and included other interesting comments. Readers will be glad to know that the 1976 revision of her 1972 book should soon be available through the New York office of Longman, Inc., 19 W. 44th St., NYC 10036. It is priced at $7.50, the publisher tells us. —Ed.]

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Structural Arithmetic and Children with Learning Disabilities

*Margaret B. Stern**

The sensitive teacher today is only too well aware of the child with learning disabilities. She may tell herself that his distress is the consequence of "learning disabilities" and "developmental lags," but this doesn't help her cope with his negative behavior nor even remember that it comes from his feelings of inadequacy and anxiety. Daily she watches him struggle; she despairs over his inability to function in the classroom. She blames herself for not being able to meet his needs, and she is filled with a sense of her own inadequacy and helplessness. The interplay between despairing teacher and frightened child breeds solutions that are defensive and counter-productive.

The primary teacher, as she begins her class in the fall, wants to give each child so much. Yet as soon as she looks at her most immature children she feels discouraged. She knows the day will not provide the many, many hours of her time that they need. Yet they have the same right that the others do in her care to learn to read and do mathematics.

For teaching reading she has innumerable materials, ideas on phonics, and a host of attractive easy-to-read books. However, for teaching mathematics she may well feel at a loss. She may have a plethora of materials, but still not understand how children form number concepts or develop computational skills. On the other hand, the latest slogan, *Back to drill*, is not trusted by the more perceptive teachers, especially in the case of these children with their poor memories, apprehensions, and deficits in learning by rote.

In the teaching of mathematics, teachers naturally feel most at home with concepts they themselves can understand. This leads to their using approaches based on the counting of dozens of little objects. Since counting does not lead to the mastery of addition and subtraction, arithmetic becomes a matter of drilling the children in hundreds of combinations. Primary school personnel have not yet understood what to do about the results of new experiments such as those of the Genevan School which show that sensori-

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This article is based on a workshop given at the 27th Annual Conference of The Orton Society, in New York City, November 1976.

*See biographical note at end of paper.

motor activities precede conceptualization; and that when a higher level of conceptualization has been reached, the child expresses what he has observed in language. All this must take place before he is able to understand or read printed symbols. The problem of improving mathematics instruction continues to be in the center of our concerns today, and the key to the solution lies in the teaching of teachers. Do they understand how to teach children, how to use materials, or in what way language can help them?

For many years I have guided teachers in the use of the Stern materials, which were designed specifically to meet these needs, by giving lectures centered around demonstrations with children. My follow-up visits have forced me to admit that lectures and demonstrations were not sufficient. Even when a workshop goes well, most teachers do not feel competent to use the materials. Instead they leave the games in the back of the classroom for supplementary free play. Supplementary to what? Why to workbooks, of course, with their hundreds of meaningless groups of symbols to be memorized. Most teachers don't know how to foster those sensorimotor activities that are the basis of concept formation. The child's intelligence and powers of reasoning are developed through experimenting with materials, yet these materials have been given a place on the periphery of their programs. The slow child most especially will be the one to suffer as he realizes he is caught in a trap of endless memorization of printed symbols with no meaning (Piaget 1976).

It is difficult for a teacher to use an approach which is so different from the way she herself learned mathematics. She cannot be expected right away to comprehend the potential of a multisensory approach. Maria Montessori knew this, and Montessori teachers are trained with children in the Casa dei Bambini for many months before they are considered qualified. Catherine Stern began her work as a Montessori teacher in the 1920's, and her approach demands equally intensive training from those learning to use her materials. Obviously when the goal is the teaching of children with learning disabilities the training should be even further deepened and extended.

I give many in-service courses on the use of these materials and I find one of the most challenging aspects is helping the teacher become aware of the kinds of barriers that come between her and her own growth. For instance, she may not realize how often she yields to the temptation to teach only to the top of the class; it is so easy to fall under the spell of the quick positive feedback that comes from that quarter! Of course there are times when everyone needs such feedback. But is it not possible to help teachers develop

160

enough self-confidence so they can resist it? In the end they will not be truly satisfied with themselves until they really know how to help those children who are intelligent, but who are slowed down in their progress by learning disabilities.

Before a teacher can understand what learning disabilities are, she should have a background of observations on the usual process of learning. Perhaps she can study herself: How does she go about learning a new task? Is she aware that learning new concepts is accompanied by quite a bit of apprehension? Greater empathy in her work with the children can be achieved in this way.

In order to develop a teacher's sensitivities to the intricate interaction between teacher and pupil it is best for her to work in a structured situation. One way such a stage can be easily set up is by having her teach with the Stern materials.

Here are some of the sensitivities and skills I think I can help a teacher develop through this medium. First, I want her to be able to spot the unusual response of a child, and to ponder it. As she tries to see the task through the eyes of the child, she should form an hypothesis as to the cause of his unusual response. Then to test her hunch, one of the most important things she must learn to do is to simplify a task by restructuring it. I want her to think over the role that language, both hers and the child's, plays in learning. She should come to realize how much more important it is to elicit language than to do all the talking herself. In some cases she must detect from a child's responses whether or not he is processing the language adequately, or whether he is simply not attending. If she decides the child is not attending, then does she know how to handle the situation by involving him so he can attend? I have discovered that when a teacher finds she is able to respond to challenges such as these, she will experience the deepest possible satisfaction in her profession.

What many an active teacher craves today is instant know-how; for her, long printed directions are out! In order to teach smoothly with mathematical materials she needs the security of having a dozen different games at her finger's tip. Yet after watching a demonstration of many games, how can she recall the right one when she needs it?

The solution to this problem was crucial for the proper use of the materials. I hit upon a picture-format with a minimum of text. Each sequence of 20 sketches was mounted in a photo holder, whence the name: The Flip Ups. (See Figures 1 and 2.) This sketch-format has been tried in classrooms

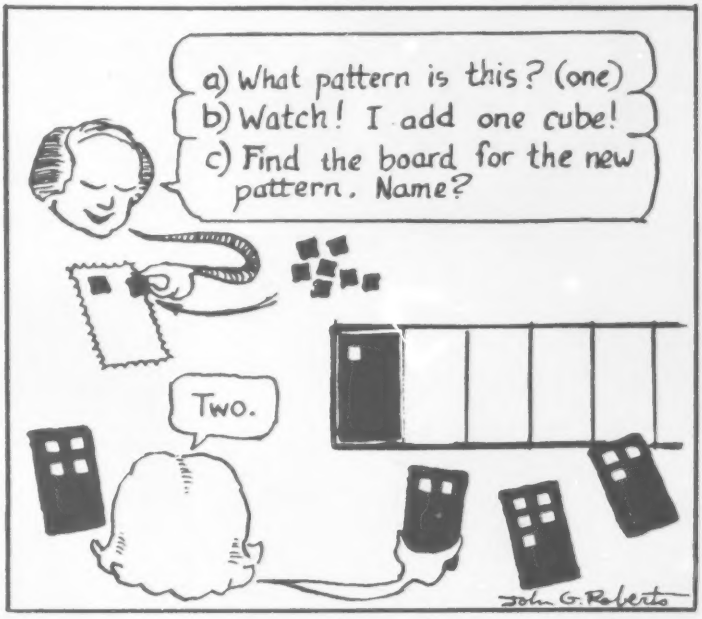


Figure 1

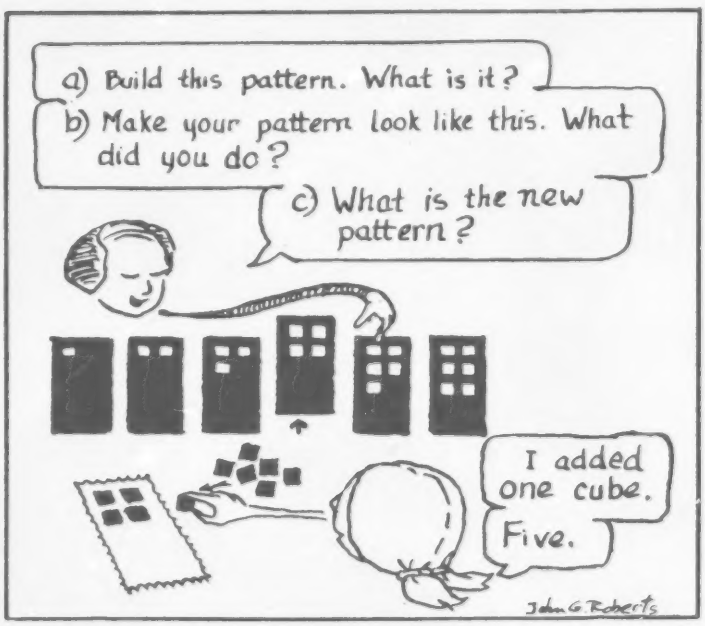
and experimented with by the Gateway School teachers on generations of learning-disabled children. Now a teacher can have carefully worked out step-by-step picture directions right in the palm of her hand. The text is brief, but includes practical suggestions for handling learning-disabled children. The teacher can easily select the variation she needs for the situation at hand.

An unsuspected advantage to the Flip Ups soon became evident. When I give courses, I can put the intern-teacher in the driver's seat. She need but glance at the Flip Up sketch while I begin a new game. Then she is able to take over. For her this becomes a rehearsal in teaching alone with the materials. She experiences *for herself* what we mean when we say materials are an integral part of sensorimotor learning. She may be surprised to find how easy it is to encourage the language and reasoning of mathematics, for they develop naturally from the children's own actions and insights.

Now let us turn to the basic Structural Arithmetic materials themselves. They consist of devices that provide matrices into which can be fitted number

blocks or groups of cubes. It is this containing aspect, this "setting-of-limits" quality, which derives from the Montessori experience, that makes them exceptionally good for the child with learning problems. And more than this, each device, whether it be the counting board, pattern boards, number track, or dual board, presents a good Gestalt. Each structure encourages the child to discover and correct his errors himself. A child who has the "set" to learn from his errors approaches his work as an intelligent experimenter. In contrast, the child who corrects mistakes only when they are pointed out by a teacher becomes anxious and must shift his attention to thinking about "how dumb" he appears. In his anxiety he may not even be able to see why these were mistakes. It is better for the teacher to observe the kind of mistakes her children are making and then to think of ways she can restructure the games. It is important for the teacher to see that as often as possible her children finish experiments with a feeling of satisfaction which, of course, results from their being able to handle each task successfully.

Figure 2


a) Build this pattern. What is it?
b) Make your pattern look like this. What did you do?
c) What is the new pattern?
I added one cube.
Five.
John G Roberts

In the beginning the children experiment with the materials on the sensorimotor level only. Language develops gradually; the teacher may initiate it in games.

Here are some of the concepts understood on a manipulative level first and then accompanied with language. In building a stair: "What block comes *next*? Which block comes *after* this block?" (Or *before*, or *between*?) "Which is the *biggest* block of all?" "Can you find the block that is *one smaller than this block*?" "Which pattern has *one less cube than* this one?" and so on. This vocabulary becomes familiar long before the child can put into words any of the number relationships he has been discovering. Before he can carry out such a complex task, he must first learn the number names in sequence. This brings us to the teaching of *counting*.

Counting is taught with single cubes either in the counting board (see Figure 3) or in the pattern boards (see Figures 1 and 2).

In the counting board, the child learns to count by counting out the single cubes in each row. He may count out the three cubes in row three and after reciting the names, "one, two, three," realize that the word, three, refers to that entire group. He then replaces the three ones with one three, the 3-block. From then on he calls the 3-block simply, three. In the same way he finds out the number name of each different block. That is, he replaces each group of single cubes with the number block of the same size. He ends up with a concrete representation that shows the cardinal aspect of each number from one to ten.

All too often there is an inordinate demand for the act of counting. Unfortunately, when a child cannot memorize combinations, he is taught counting as the only way of coping with arithmetic. He may even count little dots when he does multiplication. Counting does not lead to an understanding of the relationships between numbers, however. The child merely bogs down at the counting stage, and becomes the despair of his teacher, who finds he is unable to rise above counting to acquire any other concepts. Teachers who say their children can add or subtract often mean that they can carry out innumerable tallyings of one, and one, and one, and one!

To prevent this impasse, the teachers at Gateway begin with a few preliminary counting games, and then move on to an easier task. When the blocks in the counting board have been stood on end, they form an upright stair from one to ten. A child can climb this stair with his finger as he recites each counting name. Since there is a meaningful relationship between the word he has just said and the block he is touching, the teacher can draw his

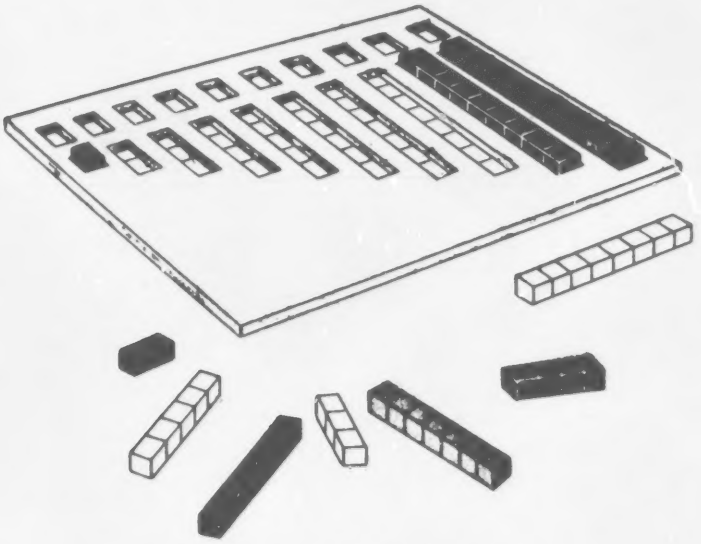


Figure 3

attention to what he is doing if he misnames a block. In giving each block its name as he touches it, the child learns to coordinate his actions with his words. The result is the ability to say each number name in one-to-one correspondence with the appropriate counted object.

During the time when the blocks are beginning to become familiar in their relations to each other, the teacher plays games to develop other abilities as well, such as visual memory, spatial orientation, eye-hand coordination and mathematics vocabulary.

I will mention the next games only briefly because they are described in detail in other publications. The unit box (see Figure 4) in which pairs of blocks fit together to make the combinations totaling 10, is at first used on the sensorimotor level only. This device also has an edge or boundary that helps the child feel (as well as see) the size of the total he is building up. After he has learned the names of the unit blocks, he can put into his own words the relationships he has discovered: "Nine needs one," or "eight goes with two to make ten," or perhaps, "Mr. Ten has no friend at all in this box" (10 + 0 = 10).

The pattern boards show more aspects of number than do the blocks, or

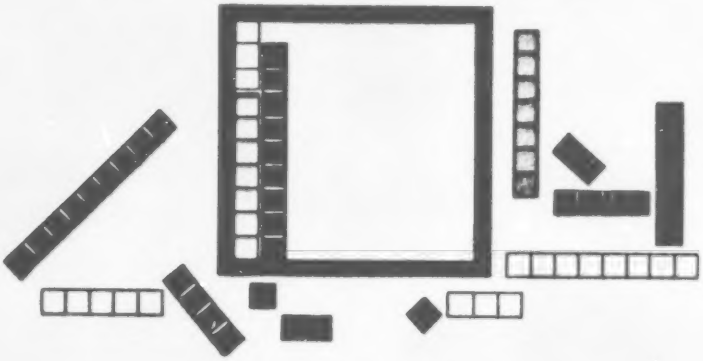


Figure 4

rods (see Figures 3 and 4). There are ten pattern boards each fashioned to receive a different number of cubes from one to ten. In each board, the empty blanks are arranged in pairs. This makes the characteristic of oddness or evenness of each number stand out. The children begin by playing games that teach them to recognize and construct each pattern. Only afterwards do they learn to identify each by a number name. The more the teachers of children with learning disabilities work with the pattern boards, the more impressed they become with them, most especially in the teaching of the operations of addition and subtraction. It is on this level that I want to go into more detail. We have worked out some very interesting experiments at The Gateway School in New York. Elizabeth Freidus and her teachers there have always been very conscious of the importance of language for children when they are moving from the sensorimotor experiences to those of conceptualization. Here are the details of one of the experiments we carried out.

Start by looking at Picture A. For many years we introduced the concept of *adding one to numbers* in just this way. Let us examine each step.

Step A. The teacher builds a pattern (number 4) and asks a child to find the board it would fit in, and to name it. This is easy.

Step B. The teacher asks the child to watch her and to listen. She now performs an act and explains it with this sentence, "I add one cube." (The child watches, but who knows what is going on in his mind? He may not be attending at all.)

Step C. The teacher involves the child again by asking him to find the board for the new pattern and to name it (number 5).

In this experiment the child is no more than an observer. *His role is to listen and to watch.* His response is limited to the locating of totals. Afterwards the teacher decides to check the child's understanding, so she tests him in the following way: After adding one cube she asks, "What did I do?" She takes his memorized verbal response, "*Added one cube*" to mean he understood. She does not realize that it is possible for a child to parrot such a phrase and have no understanding of what it means.

Then this happened: One day the teacher changed her move; instead of adding one cube, she took one cube away from her pattern. The child showed he recognized the result of the change by selecting the correct matching pattern board. But when asked to say what the teacher had done, he again answered, "*Added one cube.*" Now we asked ourselves what could have happened. Perhaps by keeping the child an observer we had never given him the chances he needed in order to fully comprehend what was going on! We decided we had omitted the most important experience of all for the child. *He* must be the doer of the action and then *he* must express his own actions *in his own words.*

For another reason also we turned back to revise our approach. Some of the children were having trouble later on when recording arithmetic. They did not seem to know what it was they were recording when they wrote the symbols +1 and −1. In the demonstration with materials they seemed only to grasp there was an initial amount called *four,* and then suddenly there appeared a final amount, *five.* They didn't seem to know what had taken place, what the operation consisted of. The teachers and I looked back to see how we could improve their early experiences. Again we asked ourselves how we could change the early stages of learning for these children to provide them with a more active role in the experiments.

Let us turn to Picture B. This shows a similar game, except it has been changed so that it is the *child* who is carrying out each action.

Step A. The teacher places a star by an empty board to indicate which pattern she wants the *child* to build. The child constructs the matching pattern with cubes, and names it (number four).

Step B. The teacher elicits the child's performance of the next step. She points to the goal pattern board and asks, "How can you change

your pattern so that it looks like this new pattern?" The child compares the two patterns, notes the difference, and then adds one cube. The teacher elicits a description of what he did by asking him to tell her.

Step C. The teacher asks him to name the new result (number five).

Now we see that the child has constructed the original number pattern by himself. Then he studied the desired goal, an empty new pattern board. This challenged him to figure out by how many cubes it differed from his original pattern. It was now his decision to add or to subtract cubes, and how many, to make the old pattern into the new pattern. So we see that now the experiment allows the child to make the decision and perform the operation by himself. He may, if he wishes to, check his final result by placing it into the goal pattern board. These sensorimotor experiences form some of the most important steps in a child's learning. In the end he wraps up his action in one sentence, "I added one cube."

The teacher should show how pleased she is and *stop* at this point. She should not be tempted by his success to rush him on into the next steps. The child may not yet have reached the level of conceptualization at which he is able to put the entire situation into an equation. Why rush him away before he has become secure in carrying out one vital action and putting it into words: When he is ready he will be able to include the other steps as well. At that point he might say: "*I start* with 4, *I add* 1 cube, and *it becomes* 5." (This was actually said by a Gateway child.)

We found that having the child play the active role in the experiment really did help him. When a child merely watches an action he does not comprehend it with the same kind of understanding as when he performs it himself. We also know that language helps; we don't know how, but we offer these thoughts. What happens when the teacher asks a child to put into words what he has just done? She gives him the chance to speak and perhaps this act of speaking forces him to relive each action in mental images while he is putting it into words. When we watch a child with no developmental lags, we note he accompanies his play with a great deal of free-wheeling speech. Maybe some of the behavior we see so often with the child who has a learning disability is the result of too few opportunities to combine actions, mental images, and language.

Let us conclude by considering some of the characteristics of these materials that make them especially good for children with learning problems. Take the counting board, one of the basic devices (see Figure 1). Each unit

block when outside the board is a separate entity, but when in place in its groove it becomes a part of a new whole or Gestalt. What emerges is a sequence in which each block differs from its neighbor by a single unit. The design of the board assures that the sequence of blocks progresses in orderly fashion, from small to large, one to ten, and left to right—so important for the child with directional problems.

Each device presents an immediate challenge to the player by giving him a task that cries out to be done. It then tells him when he is finished and whether he did it correctly. In the counting board or in the pattern boards he can see whether the blocks fit their like-sized matrices.

While fitting in the blocks or cubes the child is receiving feedback from many senses at once which he must learn to coordinate automatically. What are they? *Tactile:* He can *feel* whether the block exactly fits into the groove, or the cubes into the boards. *Auditory:* He can *hear* that most satisfactory click when they do, or the rattling around when they don't. *Kinesthetic:* He must reach further to put big blocks, or the large pattern boards into their places at the end of the sequence. He notices how blocks differ in length and weight. *Visual:* He can *see* when the board is filled; he can spot the place of a missing amount. He can check one impression by another; what he sees he can feel. This is what all children need—innumerable opportunities to coordinate sensorimotor and perceptual cues in ways that bring satisfaction and feed their growing intellect.

This is just the beginning of thoughtful, multisensory mathematical learning. Slowly and thoroughly, one step at a time, each child experiences and talks about numerical relationships. Later he learns to record his experiences in figures that are filled with reality and understanding. He is on his way, at his own pace, and with enthusiasm, to a satisfying mastery of mathematical concepts and practices. The way of teaching is determined, as in the mastery of language, by the nature of the subject, the way human beings learn, and the particular needs of the individual student.

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Margaret Stern-Biographical Note

The problems of dyslexic children have been a deep personal concern of mine ever since the days when I helped my brothers in their arithmetic and reading. In 1943, when I first saw the mathematical games invented by Catherine Stern I sensed immediately how good they would be to teach with.

Catherine Stern had brought them with her from Germany in 1938, and was demonstrating them to American teachers while looking for a publisher. At this time she was at the New School for Social Research as an assistant to Max Wertheimer. He encouraged her to place her experiments into the context and theory of Gestalt Psychology, and she did so in her book, *Children Discover Arithmetic* (1949).

I began working with her in 1943 as an eager apprentice; our friendship developed into a working partnership that lasted until her death in 1973. The arithmetic materials and first workbooks were published by Houghton Mifflin in 1951. Her daughter, Toni Gould, and I (by then her daughter-in-law) became co-authors with her of the *Structural Arithmetic Teachers' Guides and Workbooks* for kindergarten through grade 3 (1965, 1966). When *Children Discover Arithmetic* was revised I became co-author with Catherine Stern (1971).

Recently I have been focusing on teaching teachers and am at present a mathematics consultant for schools for learning-disabled children. My work centers in the Gateway School in New York City, and I have given workshops in England and Holland.

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Project Succeed: A Volunteer System in Action

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The Orton Society has always valued the contributions of all, whether professionally trained or not, in the treatment of language learning disabilities. The Maryland Branch of the Orton Society capitalized on a valuable segment of this concerned population when it inaugurated PROJECT SUCCEED in September, 1974, combining volunteers, educational institutions, and school system personnel in a tutorial program at two demonstration schools in Baltimore City and County.

We all agree that children acquire reading skills at appropriate age and grade levels as a result of conventional classroom approaches. However, we are aware that there is a percentage of school children who have not been successful with spoken and written language. What provisions does a literate society make for that population? At present, school systems throughout the country are exploring alternatives; however, a lack of trained personnel, a lack of adequate funding, a lack of awareness and communication, and a lack of interest all continue to contribute to the neglect of language-learning disabled children.

The recognition of a need to teach reading, writing, and spelling to youngsters and to utilize alternative approaches, techniques, and materials and the interest and willingness of volunteers—those who perform a service of their own free will for some purpose—produced PROJECT SUCCEED.

Conviction, commitment, continuity, and concern were the bases for this volunteer-staffed tutorial project. PROJECT SUCCEED developed as a result of the conviction that children with a demonstrated potential for learning can acquire the language skills of reading, writing, and spelling. The program, under the auspices of The Johns Hopkins University, Loyola College of Baltimore, and the Maryland Branch of The Orton Society, was based on the premise that volunteers trained in conjunction with educational and commu-

This paper was delivered at the 27th Annual Meeting of the Orton Society, New York City, November 1976.

nity agencies could make a significant contribution to the local school systems.

The project design included utilization of an elementary and a junior high school to serve as the demonstration centers. The design incorporated an initial 38-hour training session with continuous inservice work throughout the year for the volunteers under the direction of the sponsoring agencies. The project was reviewed, approved, and observed by local and state education personnel including reading supervisors, the volunteer staff supervisor, and assistant superintendents of curriculum and instruction.

The tutorial procedure was designed on a one-to-one basis twice weekly with supervision provided by the demonstration school reading specialist in addition to the institutional program sponsors. The responsibility for selecting the demonstration center was assigned to the local education agency. A predominantly black elementary city school and a predominantly white county school were chosen. Each school assumed the responsibility for identifying, testing, and assigning students to the program.

The criteria for selecting students included normal intelligence and an absence of any primary emotional disturbance or sensory deficit.

Teachers in the demonstration centers were offered tuition-free, graduate college credit for three full-day seminars at The Johns Hopkins University. Additionally the project staff requested meetings with the faculty and staff of each school as well as with the students' parents.

Volunteers were recruited from the schools and the community. Letters were sent to parents and contact was made with the school parents association before the sponsoring organizations met with the prospective volunteers. The Maryland Branch of the Orton Society, previously involved in volunteer activities, utilized its mailing lists to announce the program and request assistance from its members. Ten volunteer tutors at the elementary level and 15 volunteer tutors at the junior high level were involved in the project. The criteria for selection of tutors were an interest in children and a willingness to learn. Tutors were not required to have a college degree or previous teaching experience.

The twice weekly, six-week training session at each level provided information for the tutors on two levels: information on language-learning disabilities and techniques related to conveying skills to students. Since the students had not been selected, the pre-service training was basic and general in nature. Specialists from colleges and school systems, qualified in reading instruction, served as consultants and conducted the sessions. This enabled the tutors to

receive a variety of insights into different approaches and techniques. Practicality was the underlying theme with emphasis placed on techniques appropriate to tutorial teaching. The pre-service training dealt with phonic analysis, structural analysis, sight vocabulary, comprehension skills, and written expression.

Tutors were required to prepare lesson plans for each tutoring session based on the needs of the individual students. The students in the elementary school were in grades 2, 3, and 4; in the junior high school, grades 7 and 8. All tutors were supervised by the director during daily tutorial sessions. Tutors met regularly with the director to review successes, problems, and strategies.

When the project staff met with the school faculties few elementary staff members attended; however, many junior high faculty came. Faculty members indicated a lack of communication between the school administrator and the staff since many faculty members were unaware of the project. After the program was explained, the faculty was found to be receptive, responsive, and cooperative. Subsequent contact was maintained with classroom teachers with particular attention given to content area teachers at the secondary level.

Students' parents were invited to meet with the tutors at the elementary and junior high levels. No elementary school parents attending during the week reserved for conferences; one-half of the junior high parents attended the meetings. Invitations were extended on an individual basis to those parents who had not attended the group meeting. Considerable comment from parents provided valuable information for the tutors.

The elementary students responded well to the tutorial setting and eagerly attended the sessions. At this level, considerable emphasis was given to decoding skills, oral expressive language, vocabulary development, and concept development. The junior high students were less than enthusiastic about their entry into the program. They spoke of frustrations experienced in the classroom and were ready to admit failure. Their attitude provided an additional challenge to the tutors. In order to gain the trust of the students, the tutors approached the problem by explaining to the students they were *not* stupid but were capable of learning. Tutors continued to show an interest in their students by consistent appearance at their sessions. During an initial adjustment period, the tutors praised the students' success in order to develop their confidence and motivation. Gradually, fear and resentment began to disappear and learning took place. Emphasis was given to decoding skills, grammar, written expression, vocabulary development, and comprehension skills at the junior high level.

While the students did not achieve grade-level scores, the word recognition and comprehension assessments revealed gains for all students at both the elementary and secondary levels. There were other factors which were of considerable import but were not measured: self esteem, physical appearance, motivation, confidence, and goal-directed learning. Of significance at the secondary level were the students who spoke of "dropping out" at 16, but who have remained in school to pursue a high school diploma and are now in the ninth and tenth grades. It was interesting to observe PROJECT SUCCEED students who sought tutors on behalf of their friends. One student, who started as a total non-reader in the eighth grade with a traumatic family background and who was known as a "tough," was the recipient in 1975 of the Outstanding Young Citizen Award given by a local community club. He also introduced his younger brother to PROJECT SUCCEED the following year and requested a tutor for him. Three students were accepted into a work-study program and asked for continued tutorial support. At the elementary level, all students were passed on merit to the next grade.

PROJECT SUCCEED was considered a valuable resource program enabling youngsters to acquire the skills for reading, writing, and spelling to insure success in the classrooms. It has been continued and expanded into additional schools with continued appropriate training for the volunteer tutors. There were changes in the program as a result of its first year of operation. First, students were identified by the classroom teachers rather than by the reading specialist. At the secondary level, invitations were sent to prospective PROJECT SUCCEED students to participate in the program, allowing the student to make a choice. Secondly, meetings with the parents and with the staffs were held earlier in the school year, so more information could be given to the tutors. Thirdly, a meeting with the Board of Education and school authorities was held prior to the start of school to promote complete understanding of the program on the part of all involved.

The Maryland Branch of The Orton Society, providing for unmet needs in its community, will continue to respond to requests for training from school groups interested in implementing PROJECT SUCCEED.

The Shadow and Substance of Specific Language Disability

Jane McClelland

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The adult having specific language disability has indeed a very special set of problems and our results in remediating them fully have been something less than satisfactory in this writer's experience.

Perhaps the change in the general climate of education nationwide will have a positive effect upon these people. Certainly, there are more adults enrolled in courses of all kinds than ever before in our country and with the ever-increasing numbers seeking enrichment for a variety of personal reasons, the stigma once attending such endeavors has changed to a feeling of approbation.

Remediation of specific language disability is difficult for adults for many of the same reasons that it is difficult for any of us, under the pressures of job, home, family, and finances, to make the kind of time commitment necessary to follow a program through to maximum success. And these people, considered here, start remediation as proven failures with all of the attendant insecurities and frustrations of such a status. Not all of them appear to be failures, however.

The Case of Ernie

Ernie, for example, 37 years old, was referred by his physician whom he had consulted because of sleeplessness, nervousness, loss of appetite, and recurring headaches. In the discourse between patient and doctor, a wondrous tale evolved, one which, though commonplace to some of us, was stranger than fiction to the doctor.

Ernie worked as a machine operator in a large company and earned a salary comparable to that of many college graduates despite the fact that his education had been terminated by the mutual consent of his parents and his school in the sixth grade. The company was changing machines and the

employees had been notified that as soon as the new operating manuals arrived, they were to be studied quickly while the machines were being installed.

The problem was, Ernie couldn't read! The doctor couldn't believe it of this intelligent, well-spoken man, but it was a simple matter to prove. It was decided after medical investigation brought forth nothing significant, that the solution to Ernie's problems was to refer him for reading instruction.

Ernie's diagnostic tests determined that his oral reading was at a beginning second-grade level. Spelling was at a first-grade level, silent reading, comprehension, and vocabulary were so solidly "blocked" that no valid score could be obtained. Despite the absence of these language skills there was confidence and a special dignity about this man.

His life, as far as the world knew, was extremely successful. Ernie sang in the choir, taught Sunday School, was a Boy Scout Troop leader, and held an office in the P.T.A. He was considered to be a leader in his community.

Ernie's wife and two children played an important part in his life. Because of the children he wanted desperately to be involved in the activities which would influence their lives, in order that theirs would be "better than their father's".

Ernie's wife provided his sole reading support. He had smuggled the original machine operators' new manual home night after night so that she could read it to him until he had memorized it, and he had constructed a mock-up of the machine so that he could practice until perfect. She read the Sunday School lessons, and Boy Scout handbook and other material to him for memorization. When confronted with unexpected writing, such as directions, or extemporaneous information, Ernie asked one of the youngsters or the group "scribe," whom he foresightedly appointed, to take over.

Things had been changing drastically in Ernie's life and the new operators' manual wasn't the only factor in the change. His wife was no longer sympathetic to his reading needs, feeling perhaps that someone who was so active and convincing didn't really need to take so much of her time. Earlier, she had wanted to help him for their mutual benefit, as salary and community standing were lacking; now that those things had been attained her motivation was waning. The children were getting older and required help with their studies which placed an additional burden upon the mother who had to delay working with Ernie until they were in bed.

Ernie's new reading instruction program was the only solution and he seized upon it with an intensity that made the teacher long for more students

136

so well-motivated. Ernie came for evening lessons regularly three times a week. Although there was no set stopping time for them, they were limited to an hour and forty-five minutes lest his absorption in the wonders of learning distract him from other commitments.

His success was so dramatic that it seemed almost miraculous. Ernie's superbly developed auditory ability provided the strength through which visual and kinesthetic weaknesses could be improved.

The teacher's first courtesy report to the referring physician so interested him that he became increasingly enthusiastic. He wanted to observe Ernie more closely and made regular follow-up appointments with him.

All went extremely well for about two months and then Ernie's attendance became irregular. His program was adjusted so that he need not feel committed but was, instead, allowed to set his own schedule. A choice had had to be made between keeping on the pressure of a commitment which would maintain the air of importance in the lessons, or relieving the pressure of commitment which might cause him to feel they were unimportant. The latter course was chosen, for this was a highly motivated, mature-thinking person, whose stresses could be evaluated only by himself.

Ernie came for lessons less and less frequently and his agitation was such that the teacher became concerned. The physician was notified and requested a telephone report after each lesson.

A few weeks later the teacher received a telephone call from the physician conveying the tragic news that Ernie had committed suicide.

According to the physician it was another case of the "operation was a success, but the patient died." The program which the physician felt could have been Ernie's salvation came too late. It was not initiated until other forces and pressures were too strongly in motion to be counteracted.

The Case of Fred

There was none of the pressure about Fred that there had been about Ernie. Fred, was an example of an adult who literally had nothing to do but attend classes. There was a total lack of stress and there was no doubt about his appearing for lessons. They were to be, in fact, the most important thing in this tall, strapping, 28-year-old's life.

Fred's parents made the appointment for him when they heard that this teacher could teach him to read. According to their story, others had failed multitudinous times "without giving the boy a fair chance." He was described

as a sincere boy, with no mind for books, who was good at helping "around the place"; he was kind to animals and never caused trouble.

At this point the parents were frantic because the father had just learned that he had an incurable illness. This had set the parents' minds wondering, apparently for the first time, how Fred would manage without them.

Very little specific information could be obtained because the parents were reduced to tears and their pleading was intense. However, this did not sound like a case for a teacher accustomed to working with students enrolled in competitive preparatory schools who already had very full schedules. The interview ended, as so many do, with the request, "If you would only just see him. You don't have to teach him, just see him"! So an appointment was made for Fred.

Prior to this visit the teacher called the university clinic which had last seen Fred. The information was interesting but none of the child study evaluations over a period of many years had arrived at conclusions. They stressed Fred's good humor and willingness to work but gave no reasons for his lack of success in school; the reports were too general to be very useful. The nearest thing to a concrete evaluation was the comment of a psychologist that he had given an oral report to the parents, but the report was not written for the file.

At one point, after fifth grade, Fred had been put in a "special school" and had stayed there for almost a year before being referred back to his neighborhood school. Lack of success in school, a quiet rural life and lackadaisical parents had finally contributed to his not going to school at all.

The psychologist at the clinic urged the teacher to accept Fred as a student saying that his case was far from hopeless. It seemed that as Fred was leaving the psychologist's office one day he had to open a low swinging-door, the catch of which was on the opposite side. Fred had ascertained how to unclasp the door by reaching over it and doing so, a fact which didn't seem significant in the same way to the teacher that it did to the psychologist. Answers to direct questions by the teacher regarding Fred's IQ were avoided until the information that he was "slightly below average" was at last divulged.

Fred came "to see" the teacher who already knew all too well what the outcome would be. It is well nigh impossible not to accept a student who comes willingly and hopefully. He presented himself well a id was, as advertised, a sincere, kind, thoughtful person. Fred was eager to start studying.

"Testing" indicated nothing save a random word or two guessed at for reading and for spelling. The letters of the alphabet—which could not be recalled in sequence or written correctly—could be identified.

The program began at the very beginning, just as though Fred had never been to school. Although adults usually move rapidly this one's progress was very slow and he had an unusual amount of difficulty retaining that which had been learned the previous day. Blending sounds into words required superhuman effort as evidenced by the perspiration pouring off Fred's face as he tried to read. But try he did and gradually his efforts were rewarded.

It was impossible, at first, to determine which concepts would be merely difficult for Fred to understand and which would be virtually impossible, and the judgement of the teacher had to develop as Fred's thinking patterns were revealed. Finally, after 18 months of faithful daily study, Fred's spelling and reading reached a fourth grade level in word attack. Comprehension was another matter, and it was in this area that the greatest fluctuation occurred. At times and in certain material Fred's comprehension would match other scores, but more often it did not.

Six months later there had been virtually no change in basic reading and spelling skills, but Fred had developed great awareness of things around him and felt confident about his language skills. He had also become more independent as, at the teacher's urging, his parents had stopped driving him to his lessons and had, instead, permitted him to take the bus. Investigation of "sheltered shops" of various kinds in which workers are carefully supervised while performing simple tasks, indicated that Fred could fit into such a work situation.

However, fourth grade reading skills with fluctuating comprehension were not sufficient for Fred to go out into the world alone. Before he was released from his reading lessons an intensive study of the words and symbols necessary for survival in his particular area of the city was completed successfully.

In addition to developing an awareness of things around him, Fred had also developed an awareness of a "well-off" widow fifteen years his senior! Their marriage was something not entered into without a great deal of counseling on the part of the minister. Fred's emergence into the world as an independent being and a provider, of sorts, was the result of effort greater than that extended by many doctoral candidates.

Conclusion

The rewards of teaching adults are tremendous, as are the frustrations. One never knows which direction their reading programs will take and must be on the alert. Their lives are not as controlled as those of younger people and the pressures placed upon them by life itself must be carefully and constantly weighed and evaluated by those working with them. Sometimes it is possible to accomplish great things, but sometimes one must settle for more limited achievements, like Fred's "survival level" of literacy. One must be very sensitive to the pressures in the student's life and, where possible and necessary, help him to get expert counseling to alleviate them. One can always try, and sometimes succeed, even succeed spectacularly. There are no miracles, of course. The teacher must call on all the knowledge, skill, patience, and ingenuity she can marshal and the student will need to bring to the task persistence, sustained motivation, and resilient hope to draw upon in periods of slow progress. It is, by and large, well worth the effort.

200

Dyslexics as Adults: The Possibilities and the Challenge

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Editor, *Bulletin of the Orton Society*

Unused aptitudes make trouble for their owner and his world.

The separate aspects of an individual and his inner and outer world are legion and their harmonious interactions in his ongoing personal and social life present an integrative functioning so complex as to be beyond the complete comprehension of any single individual.

In the hierarchies of social and personal life and growth there is obviously neither Perfection nor, I believe, a Final Template (Platonic Ideal, if you will). There are only intermediate goals of more or less generality and on briefer or longer time scales. Small and partial achievements of near-perfections we do see, and also growth and change, and failures and deteriorations.

While it is well (and the highest privilege of the human intellect) to take as large and long a view of the world as we can, and to govern action by it as we are able, it is at the levels of the smaller organizations and their almost, but never quite, discrete parts, somewhere between the infinite and the infinitesimal, that we can act, and can even choose to act. "Let's get down to cases," we say.

Take a human aptitude, or set of aptitudes; take a vitally important one—language. Take the text, "Unused aptitudes make trouble."

A young man (call him Phil) recently said, "For years I've had this feeling that I've been able to use only a third of my mental powers. The other two-thirds just roll and rumble around in my head going nowhere . . . confusing, frustrating. . . ." He had tried marijuana, alcohol, heroin (twice only), Viet Nam, two colleges (one flunkout, one dropout), several jobs, and now marriage (a good one) and a regular but only temporarily adequate job. He was still fighting for his very life, achieving deep insights and, at last, likely to come through. His parents, supportive in spite of their fears and disapproval, and his social and economic position, had protected him from the most devastating of the consequences suffered by many of his less favored agemates. He is a fine instrument, largely repaired but still out of tune.

Why do I mention him? What of his past? His future? Need his growing up have been so frustrating and so stormy? Is he unique? Or representative?

In mid-adolescence I knew of him as a "childhood reading failure." His expensive private school had a well-meaning "remedial reading program" whose inadequacies left this highly intelligent, sensitive boy with a deep sense of inadequacy in the academic arena. His outstanding competence in sports and a moderate talent in graphic art and design kept his emotional head above water, at least some of the time. Now, with his specific dyslexia diagnosed, with appropriate treatment instituted and with good initial progress, his anxieties about himself are lessened. His motivation is high and he, his wife, and his elders look with some realistic hope toward his learning to "swim" as expertly and confidently in his chosen profession (which requires more education) and in his life as he does in the competitive swimming pool and the recreative lake.

While favored in many ways and subjected to particular stresses in others, Phil is *representative* of a large group of the population of the linguistically inadequate—5 percent, 15 percent, 25 percent, perhaps—the figure depends less on epidemiological knowledge than on definition and on the viewpoint of the estimator. Phil is also rather *typical* of one less numerous part of that group—the upper-middle-class, intelligent, "advantaged" young man whose very high potential contribution may never be made in full to a world which sorely needs it all. He must first master the language skills which have blocked, and still block, his path to vocational competence and fully satisfying personhood. Perhaps he can do this; we know those who have, even starting in middle-life. At best, also, he will draw from the negative experiences and frustrated gropings of his youth a strength and a compassionate insight into himself and others which will make him an effective, understanding man and, in time, a wise elder. For *this* "Phil," these outcomes now seem quite possible.

Let us look more broadly at the problem of prognosis in dyslexia. For the present we shall define dyslexia as a constitutional ineptitude of hampering degree for learning language skills, specifically those of the mother tongue. This rules out low intelligence, primary emotional disorder, environmental (including educational) deprivation, and brain damage (pre-, peri- or post-natal), any of which may (but most often do not) coexist with the specifically language-determined problem. Other often-noted symptoms—delayed speech, right-left confusion and the like—which seem more directly related could be discussed, but space requires us to ignore them in this paper. What has happened to the otherwise normal but excessively poor readers,

spellers, and writers of the past? What is happening to them as adults now? What may or can happen to today's dyslexic school-children when they grow up?

Time was when a king hired scribes and signed "X" to his papers, the country squire pitied his minister brother, and the school "dunce" ran away to sea and came home a captain "if he had it in him," or the restless adolescent went West and founded an empire. The captains of business and industry needed to be intelligent and ambitious, but not necessarily literate, to climb the ladder from the bottom rung. The myths of Horatio Alger, Dan'l Boone, and the Gold Rush were at least *founded* on fact, and the routes of agriculture and apprenticeship led to more prosaic but still potentially successful adulthood. "It didn't matter about the girls," it was generally said. Who expected women to read—even after most of them could?

As the First Industrial Revolution became the Second and it grew into the Automated-Computerized World of today, and women entered the employment market, these routes grew less passable. More casualties among the unskilled, undereducated, illiterate unemployables fell by the wayside. More frequent became the quietly and unquietly desperate young people who could not succeed in studying their way to the new, now technological, frontiers, especially with Dick and Jane to hurdle at the beginning of the course.[1]

There have, to be sure, been illustrious examples of highly verbal, intelligent and persistent individuals who might nowadays be called "*very* dyslexic" or at least "moderately dyslexic" who became illustrious, often literary, men and women. They range from Demosthenes through Hans Christian Anderson to Einstein, Edison, Woodrow Wilson, George Patton, Harvey Cushing, and Lawrence and Amy Lowell, to some well-known figures of our own day. (Dr. Lloyd Thompson [1969] has presented some of them elsewhere in his paper, "Language Disabilities in Men in Eminence".) Generally their biographies reveal a mother or other adults who, with faith and patience, taught them to read. Somehow they got into their vocations, after which their persistently inaccurate or even bizarre spelling,[2] was accepted as a personal idiosyncracy and caused trouble only to their editors. We all know men and women of lesser fame, in our families, among our colleagues and friends and perhaps even among ourselves, who have had similar experiences.

[1] Not that dyslexia is the whole problem, by any means; just a very important part of it.

[2] See Cushing's reference to shopping at a "Turkish bizarre."

That they—we—have made made successful adaptations does not negate the initial handicaps.

In almost every case I know, and I think this is *very* important, the statement current in the professional fields where dyslexia is recognized holds true, "*Wherever and by whomever the diagnosis is made, the treatment of dyslexia, whoever administers it, is of necessity educational.*" Edison's mother and Cushing's (and many another), Wilson's and Patton's fathers, Einstein's uncle and medical student companion, a particular teacher here, a tutor there—someone taught or tried to teach each of these children what their essentially no-more-gifted peers seemed to absorb quite easily from their surrounding culture.

But some children are less fortunate or have degrees of difficulty beyond the understanding or skill of their well-intentioned, caring adults. Like Phil, they may come through, or part way through, with or without scar tissue. Or they may assassinate a John Kennedy. (There is good evidence that dyslexia was part of Lee Harvey Oswald's problem, but we do not know of such evidence in the case of the killers of Robert Kennedy or of Martin Luther King—by no means all the world's social and psychological ills have a dyslexia component!) Many millions, the literate world over, simply lead more or less unhappy, unfulfilled lives to the extent that they are denied the satisfaction of competence and the enrichment of experience that full literacy makes possible.

Need this be so? I believe there is good evidence that it need not. I, myself, know schools and professional individuals whose files contain records of literally thousands of cases of children and young people and not a few adults, restored to the intellectual mainstream in the past 40 years. In the best cases preventive action has kept many "high risk" youngsters from knowing failure in the first place and has given them resources with which to meet later challenges. The students have benefited by the diagnostic and treatment orientation of those who have helped them; but the world, alas, has suffered from the lack of research designs and collective analyses of the results of these efforts. Most of us who test and teach are more concerned with Johnny's and Mary's individual histories, if we can know them, than with statistics and controlled studies. Most of my own cases are in such an unanalyzed collection. On the basis of this kind of personal experience most of us believe what we are doing is valid, and that the results are even reliable. I wish more people would offer well-written proof, but few have.

Circumstances of a generation ago, and wise guidance in the early sixties,

put me in the way of submitting a small, but I think sound, study of the adult accomplishments of some dyslexic boys who were diagnosed and given, even in the '30's and '40's, what many of us still consider at least the appropriate kind of treatment and enough of it to liberate them for academic progress. Twenty boys with moderate to severe language learning ineptitude turned out by young to mid-adulthood to have done a shade better in the schooling they had completed and in the socio-economic status they had achieved than had 36 closely similar school-mates with normal to superior language learning facility. But the 18 baccalaureate and 14 advanced degrees and the socio-economic class ratings of the 20 "low language" boys were only the statistically countable evidence that, given childhood diagnosis and treatment, "dyslexic" youngsters *need not* fail on these dimensions. Important but less numerically measurable were their choices of occupation, minimally affected by their language problems, their high social contribution and the generally positive, well-balanced and happy tone of their personal lives. As with Thompson's more illustrious subjects, they could and did read, and their residual spelling and handwriting problems could be accepted as nuisances to be coped with through wifely devotion, secretarial efficiency, personal typing or, when necessary, shrugged shoulders. They were as near to fully functioning individuals as any of us.

On a case basis I could match these men with plumbers, farmers, social workers, architects, a provincial police officer, a TV program designer, or many another. And I very frequently meet relatively successful, obviously dyslexic, parents of desparate, failing, dyslexic young people. I also see, as who of us does not, adults who haven't "made it" but who might have, had they been able to remove, climb over or by-pass the language roadblock. Some, like Phil, can still do so. We hear of them from time to time, and read of them in the *Bulletin of the Orton Society*. We are reminded of Harold Danenhower's rescued unemployables (Bull. XVI), Mary Helen Robinson's "Kenneth Johnson" (XIX), "Gail" and "Lou" (XXVI) and many others.

Some cannot make it; they have the capacity but the competition of the pressures of adult living may outweigh the motivation to learn.

Something can be done about this situation—the Phil's we know can be helped to use much more nearly *three*-thirds of the potential of which they are conscious. We *can* help them with the problem if we have the will, the open-mindedness, and the energy to tackle it. Will we do so? The social and mental health stakes are high.

June Lyday Orton 1898-1977

June Lyday Orton 1898–1977

With the death of June Lyday Orton on March 12, 1977, the Orton Society has lost its primary founder and first leader.

June Frances Lyday was born on August 3, 1898, in Newton, Iowa. She was elected to membership in Phi Beta Kappa at Vassar College from which she was graduated, at age 19, *summa cum laude*, in 1918. From Smith College School for Social Work she received the degree of M.S.S. as a member of its

first class in 1919. Subsequently she did graduate work at the State University of Iowa, at the Merrill Palmer Institute in Detroit, Michigan, and at Columbia University.

She was chosen by Dr. Samuel T. Orton to be chief of psychiatric social service in the new Department of Psychiatry which he organized in 1919 at the University of Iowa, and at the Iowa Psychopathic Hospital. There she participated in the planning and carrying out of one of the country's first programs of rural, mobile, multidisciplinary mental hygiene clinics. Dr. Orton's interest in 14 of the children referred because of reading retardation to the first of these clinics in January, 1925, began his study of the problem of specific language disability, in which June Lyday was closely involved from the outset.

Following their marriage in 1928, the Ortons moved to New York, where they continued their work together as part of Dr. Orton's practice of neurology and psychiatry.

After her husband's death in 1948, June Orton moved to Winston-Salem, North Carolina, where she made her home and practiced her profession as a specialist in specific language disability (dyslexia) for the rest of her life. Through the invitation of Dr. Lloyd J. Thompson, she joined the faculty of the Bowman-Gray School of Medicine, where she established a clinic for reading and speech disorders. Here she was concerned not only with the diagnosis and educational treatment of patients, but with the training of remedial teachers and with the enlightenment of students of medicine and psychology. This clinic developed into the Orton Reading Center, her private practice in which she had a corps of able and devoted associates. As she approached retirement, the Center was integrated into the Special Education Department of Salem College.

A professional in her own right, and so honored in the Samuel T. Orton Award of the Orton Society in 1969, it is for her part in the Society and its widening influence in the world that most of us know her best. When the Society was founded in 1949 to carry forward the work that Dr. Orton had begun, she was chosen by common consent to be its first president and was its leader for many years, 12 of them as President. She edited the Society's *Bulletin* in all but two of its first 14 annual issues, and developed it from a newsletter for members into a truly professional journal. After she gave over the reins of authority to others, she stood ready to help as consultant, tactfully passing along the fruits of her experience to her successors in any ways of which they felt the need. To the editor of the *Bulletin* she was

particularly helpful at all levels, from philosophy and editorial judgment to practical details of copy-editing and publication, responding to requests but not interfering.

She continued to the end of her life to give herself unstintingly, through writing and teaching, to meeting the needs of individuals and communities. Her literary talents and editorial skills brought enlightenment and delight to an ever-increasing public. She prepared Dr. Orton's papers on dyslexia for wider dissemination and wrote and lectured extensively for a wide audience of scientists, educators, and parents.

June Orton was essentially a very shy and private person whom it took time to learn to know, but those of us who had that privilege found her sweet and loving, a gracious and generous hostess, and a loyal friend. For her gifts of herself to the Orton Society, to her friends and colleagues, and to her patients and their concerned elders, we are all immeasurably in her debt. Characteristically also, she thought of the future and, as will be announced, made generous provisions by legacy toward the carrying on of the work of The Orton Society and of scientific research in the field to which she and Dr. Orton had given a lifetime of intelligent, loving devotion.

In the words of her dear friend, Lauretta Bender, "She was a wonderful person, and contributed more than her share to the world, including the happiness of Sam Orton and the rest of us who knew her."

We mourn her loss, but, even more, we celebrate her life and our privilege in knowing her.

—MBR

In the journal *Mental Hygiene*, 1926, Volume 10, pp. 759–786, there appeared a paper by June Lyday (Orton)—as far as we know, her first publication—entitled "The Greene County (Iowa) Mental Health Clinic: An Experiment in Extension of the Out-Patient Service of a Psychopathic Hospital into a Rural Community."

This was a multipurpose clinic serving persons with all kinds of mental health problems, and is comprehensively described. The following two sections of this paper seem particularly interesting to us today, one (pp. 765–766) having to do with the gifted child and young person, and one (p. 769) with the very beginnings of Dr. Samuel T. Orton's work with specific language difficulties, later to be called *dyslexia*. These sections are reproduced below:

In order to avoid giving the impression that the clinic was interested primarily in the subnormal child and that reference to the clinic, therefore, implied some degree of mental defect, some of the brightest children in each school were selected by the teachers for examination. The teachers were also asked to refer children who were failing in their school work and those whose problem was one of behavior rather than of academic achievement. Of the children examined, 14, or 10 percent, were referred by their teachers as "bright"; 84, or 65 percent, as "nervous, peculiar, or unruly." Each child was given a Stanford-Binet test, and the distribution of the intelligent quotients in each of these three groups is shown. . . .

Over half of the children referred by the schools were of average or superior intelligence, about one-third were in the dull-normal and borderline groups, and one-tenth were found to be definitely feebleminded.

Bright Children. The 14 children reported by their teachers as "bright" included eight boys and six girls, from five to eighteen years of age, in various grades from the kindergarten to the twelfth. All were doing good school work and their intelligence quotients were found to range from 106 to 143. In relation to their chronological age, eight were in the expected grade, three were somewhat behind, and three—all girls—were in the grade ahead. Considering their placement from the point of view of their mental ages, four were one grade below their indicated capacity; three two grades below; one three grades below; three four grades below; and two five grades below. Recommendations as to promotion, however, were made in accordance with the physiological and social maturity of the individual child rather than according to his mental age alone.

One of the cases in this group was that of a first-grade girl of very superior intelligence (I.Q. 141) who was the only child in a family of adults. She has acquired a very grown-up manner and could get along much more easily with older people than with other children. The examiner felt that, in her case, training in making social adjustments was very important and could be carried out better in a group of children of her own age than by allowing her to be advanced into the older group where she belonged intellectually. On the other hand, a well-developed five-year-old kindergarten boy was seen who was the leader in his class and volunteered the information that he was the smartest boy in his room. His mental age was found to be only about a year in advance of his chronological age, but because of his attitude of superiority, it was felt that promotion into the first

grade, where he would have more competition, might be a wholesome measure at this time. The eight superior children who were in the intermediate grades—the fifth to the eighth—were carrying their school work easily and presented no particular behavior problems. They are a group, however, that should have especial consideration in the school because of their potentialities for leadership. Endowed with superior native ability, it is important that they be trained to make full use of their talents, that they be given a broad cultural background, and that they early learn to recognize social values and to make good social adjustments. If their superior capacity is not recognized, they are apt to form habits of poor application and of inaccuracy. Double promotion may serve as a stimulus to some, but often entails physical and social demands beyond the maturity of the child and may result in the omission of important school work. The problem is being met in some schools by increasing the scope and requirements of the work in the intermediate grades for such children and this suggestion was made in a number of these cases examined in the clinic.

The four superior high-school pupils who were seen were already carrying full schedules and many non-academic activities, and were chiefly concerned with the question of whether or not to plan to go to college. The clinic findings in each case indicated the practicability of further academic training, and as a result, one of the senior girls who had expected to go to work after graduation was offered financial assistance by a generous member of the community so that she might attend the state normal school the next fall.

The second section, dealing with Dr. Orton's work, follows:

Fourteen children in the group referred as "dull" were found to have had special difficulty in learning to read and formed a sub-group of particular interest. They were from seven to seventeen years of age and were scattered through the first nine grades of school. Thirteen were boys. Their disabilities in reading varied from a tendency to the reversal of letters and syllables and an insecurity in recognizing words—fairly common among all young children—to a practically complete failure to read any words correctly. Because of their special difficulty, they were unable to keep up in the other studies that called for reading, were retarded in school, and were usually considered inferior in intelligence by their teachers. These children showed a variable emotional reaction to their failures and some had developed a decided feeling of inferiority. In spite of their handicap, ten made at least an average

score on the Stanford-Binet examination, but supplementary tests indicated that this method of measuring intelligence probably does not give an adequate estimate of the general intellectual capacity of such children. The number of these cases and the psychiatric and educational problems involved aroused a very special interest on the part of the clinic staff in such difficulties, and one of the children was later studied intensively at the psychopathic hospital by the director, with the result that certain problems in cerebral dominance were brought to light which are to be made the object of further scientific investigation under a special research program during the coming two years.

REVIEWS

Some Roads to Understanding

> Criticism is commonly defined as telling what a writer sets out to do and giving an account of how well he does it. There is also the question of whether it is worth doing, since who wants to read even skillful comment on matters hardly worth inquiring into?
>
> If this second question has major consideration, then the review becomes a review-essay. All good criticism has at least something of this quality, the fact of the review indicating that the book or article examined deserves attention.*

The adult who would understand a child with baffling learning problems, or who would like to know more about his own similar difficulties, can tackle this problem in several fruitful ways. He or she may be a listener or a doer, rather than a reader. In the former case, discussion with a knowledgeable, empathetic, experienced teacher or counselor who can "say it in plain English" may be his best route. If he or she learns best by doing, then trying out or watching tests himself, and watching or trying component learning experiences under expert and sympathetic guidance can be enormously enlightening and practical.

If the inquiring adult is a reader, he or she can be much more "in charge" of his or her continued education, much less dependent on a third person. Some people prefer to follow a planned route from the simple to the complex, from concrete and particular to more abstract and general ideas. This is logical, and may (or may not) save time, and result in a sense of accomplishment and security. Other people like to "dive in" and read more widely from the start, making more of their discoveries and doing more of

Manas 30(23):4 (June 8, 1977)

their organization on their own. This brings them a periodic sense of sudden enlightenment and often cuts through the red tape of printed knowledge which was, perhaps, of more value to the writers than to the readers. The inherent dangers of premature conclusions and the espousal of panaceas and other oversimplifications along the way will tend to correct themselves if the inquirer maintains a persistent open-mindedness.

However his wisdom is reached, it generally results from progressive organization of knowledge and insight from many sources and through all the available avenues of learning. How much help the seeker needs and can find is a matter of infinite variety depending on his own capacity to receive, assimilate, and organize experience. All of these, incidentally, can be sources of learning aptitudes or ineptitudes at any age. The inquirer's good fortune in finding resources, and his motivation and persistence in using them, are equally important and variable.

As one reviews the incoming literature, and discovers older, hitherto neglected books and papers, the ways in which the writers came to their understandings sometimes appear and are helpful in indicating how readers can make use of the works, and what they can profitably touch lightly or disregard—or even express exception to. In some books reviewed or mentioned here, like those of the Weisses or Careth Ellingson—to mention only some of my own reviewings—the authors show their own thoughtful, sometimes omnivorous, investigations and share the impact they have had. We can take as much of this as applies to our needs and reserve either use or judgment of the rest until later. The job of selection and organization is personal.

There are those, like Langmeier and Matějček, and like Naidoo, whose purpose is to present findings objectively, with appropriate comment or interpretation, for whatever use the world can make of them in information and resultant conclusions. Editorial compilers, like the Tarnopols, bring together and set before us material which might be difficult to gather from readily available sources. Some presentations, such as Dawkins', are of an author's newly developed ideas, or present a specific or wide-ranging result of a longer lifetime of study, as with Arieti or Eckstein.

We need, I think, all of these and many other kinds of books, whether as parts of planned sequences or of more eclectic search, and bless the people who taught us how to read them! "Wisdom is where you find it," and anything which speaks to us today enlarges our understanding of the human condition and has its effects on our ability to cope with the problems of

language—so large a part, yet by no means the whole, of what makes us human.

—MBR

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The Body Has a Head, by Gustav Eckstein. 1969. New York: Harper and Row.

What are the Central Nervous System and the Head that tops it off? What are the parts for, how do they work, and what is the whole complex about? What is our place in the universe—and its place in us? What ideas are touched off by each of these considerations? With encyclopedic knowledge, refreshing wit, and charming urbanity, this many-sided scientist gives us 800 pages of effervescent erudition. Some 200 brief essays, grouped in 19 sections, take us from the ancient philosophers and the beginnings of life, through the structures and functions of the body as served by the nervous system to "The Head: the Rest Exists for This." Each essay has a denotative title, and a suggestive, connotative one ("Thales: Who Measures Is a Scientist"; "Electro-Cardiogram: Walkie-Talkie"; "Skull: 'Alas, Poor Yorick' "; "The Person: It Is Flaming"; "The Word: It is Noble"; and so on).

This might be a hammock-book, if it did not weigh in at nearly three pounds, but we wouldn't have it a page shorter! However one holds it, it seems more for browsing than for consecutive reading. Nevertheless, it contains just about the whole "course" on the nervous system of man, placed in nature, dissolved in distillations of humane thought, and served in sparkling crystal goblets of words. In the autobiographical note on his own complicated life history, Dr. Eckstein says, "Somewhere in the course of this I had found a pen, and that clarified everything" for him and, happily, for us as well!

—MBR

The Selfish Gene, by Richard Dawkins. New York: Oxford University Press.

Here is a treatise on genetics, originating in Oxford and Harvard Universities, which first catches us in a deterministic trap and then shows us a way out. What is man but an elaborate machine for the protection and perpetuation of the genes? The gene pool must be saved at all costs, and so the gene,

having its self-interest at heart, can justifiably be called "selfish," although the author keeps tongue in cheek as he uses a word which seems to imply a human kind of consciousness behind its maneuvers. The genes are the carrier material of the slow process of evolution, and are subject to mutations that are usually lethal but occasionally positively productive. Especially, though slowly, they work toward evolutionary change through the adaptive process of natural selection. Most of the book is devoted to an exposition of this state of affairs.

This would leave no room for the freedom of choice and of self-direction in change which man holds onto as one of his dearest prerogatives. Is it only an illusion? No, says Dawkins, for man is not only a "gene machine" but a culture bearer and a culture builder. He, pre-eminently among animals, can pass along through the generations the results of his learning to do and to be, for he has developed the necessary technological, social, and intellectual-spiritual patterns and the means of recording and communicating them. Physically and in mental potential the perpetuation of these *memes*, as Dawkins calls the units and complexes of culture, change man not at all, but they are the fast route to his survival, adaptation, and so evolution as a species. Insofar as the memes carry out the gene patterns of concentrating on perpetuation of themselves, they, too, could be said to be "selfish." But man, and for all practical purposes man alone, has conscious foresight, and so "can rebel against the tyranny of the selfish replicators." Call it as you choose, a capacity for "short-term altruism" or "long-term selfishness" in the interests of the race, it is this good, left-hemisphere, conscious, verbal thought which gives freedom and can direct action. It may yet save us from ourselves and from "the slings and arrows of outrageous fortune." The major meme-vehicle is, of course, language—spoken, written, and read—another version of the message to the keepers of this key!

—MBR

Creativity: The Magic Synthesis, by Silvano Arieti. 1976. New York: Basic Books.

Here is a book too big for review. Read it, study it, and be affected by it! Only so will you give it a chance to fulfill its destiny—which is to increase insight and creativity in the world *through you*. This is a study, not a sermon nor a sales talk, but it can be effective, for it is informative, catalytic, Himalayan.

The work comes out of the author's long, productive and creative life in science and psychiatry, enriched by an artistic heritage rooted in his Italian youth, and seasoned by his own innovative, humane personal being.

He begins with chapters on the *nature and major theories of the creative process.* Those *psychological components* of creativity on which he focuses are imagery and cognition—amorphous, primitive and conceptual. The *products* of creativity are examined in wit, poetry and the aesthetic process, painting (with a note on music), religion and mystical experiences, science, and philosophy and general system theory.

Creativity and the sociocultural environment are shown to be mutually involved in each other's development. Since creative thought and acts are *individual,* this needs a couple of chapters, leading, at the end, to a consideration of *creativity in the larger contexts of neurology, biology, general system theory, and the spirit of man.*

This is a mere topical survey. The meaning and excitement of the book are all-pervading and much deeper and more significant. As one reads, one is constantly exclaiming, "Aha! So that's how it works," or, "That fits Jack So-and-So," or "Maybe *that* is how those two things should go together." Or one comes up with a theory, from point *a* to right here and now, of why it has been so very difficult to get certain well-meaning people to take a calm, objective—but new, and therefore maybe unsettling—look at an educational problem and how one might go about its solution on both the thinking and the feeling levels. Both the "why" and the "how" call for some measure of creative insight into the stumbling-block as well as the problem itself.

(Of course, by this point some readers would have been inspired to write a song or a sonata, to paint a picture or conceive the perfect statue, or take an Einsteinian leap toward the understanding of those puzzling "quirks" in the emptiness of space which turn, somehow, into experienceable matter. However, one "creates" as one can, which means putting together afresh what one knows of one's world. Whether the result is great or relatively unimportant, merely spontaneity or originality or "ordinary" creativity, or even, once in a long, long while, what Arieti calls "great creativity," the participator is lifted by its coming into being above his ordinary life and feels a touch of what it might mean to be the Great Creator.

So Arieti joins the giants we have known before, and stands with Eckstein, Dawkins, Kinget, and the others we have more recently read (thanks ever and again to Grandpa and Miss Roberts who taught us how) and reviewed in these pages. They are the "culture heroes," the changers of

218

Dawkins' *memes*, if you will, who give us the best of life and carry us (and eventually our children) forward with hope and delight.

—MBR

Silent Language, by Mcdonald Critchley. 1975. London and Toronto: Butterworths.

As we go to press we have just received this most beautiful and significant book. It is handsomely printed, bound and dust-jacketed, lavishly illustrated with photographs, several of them in color. The references are scholarly, as we should expect, drawing on archaeology, anthropology, the observations of travelers, world literature of all times and continents, and medical and other scientific writings. The content, while wide-ranging, is of a somewhat different orientation from that of Edward Hall in *The Silent Language*, being concerned less with everyday mores, habits and culture patterns and more with deliberate attempts to communicate through gestures, symbols, and movement in sign language, dance and drama, as well as visual representations in print and the decorative arts.

We are not at all surprised, but nonetheless delighted, to find the English language used with skillful versatility, both in wide range of vocabulary and in the adroit mixture of abstract and concrete, learned and vernacular, and technical and common speech. Whatever he is saying, the author is in full command of his verbal medium, a fluent, seemingly easy performance, though without pedantry or ostentation. When he uses words with nice distinction, or employs freely the terminologies of philosophy, science, technology, linguistics and, of course, medicine, we know it is done to convey both precise information and his intended shades of significance and emphasis. His skillful use of context helps us fill in gaps in our understanding without staggering under an undue burden of definition, and such as we must bear at times is lightened here and there with touches of subtle wit or by use of analogy or anecdote.

That we should feel so strong a need to comment on aspects of the author's style which we may suppose are to him simply the unconscious use of taste and training in the larger service of communication, no doubt shows more the low estate to which fine writing has fallen elsewhere than it does any deliberate effort on his part to make verbal language do his bidding. He writes as he thinks, with the language at his command. How else would one

proceed? Still, we note with appreciation what he probably takes for granted. His untranslated quotations from the Latin and the French, are not so long nor so frequent as to leave us monolinguals baffled for too long—just regretful for our inadequacies which cut us off from riches as all illiterates are denied what they might otherwise enjoy.

To return to the substance of the book, Dr. Critchley begins and ends with consideration of the possible evolutionary, if not historical, connection between silent and spoken language, but we feel that by the time we have read his book fully, as I have not yet been able to do, we shall be able to ask the question at the end with far more understanding of what it means than was ours to begin with. He says, "Gestures, like speech, may therefore be regarded as a dynamic and living subject which may not have as yet achieved finality in respect of evolution. . . . Gesture, we discover, is a fundamental aspect of personality, reflecting social *mores* and racial influences [and has many other attributes] . . . . So gesture, though silent, is full of eloquence to the vigilant and sagacious onlooker who, holding the key to its interpretation, knows how and what to observe."

—MBR

Psychological Deprivation in Childhood, 3rd English edition. by J. Langmeier and Z. Matějček. Edited by G. L. Mangan. Translated by P. Anger. 1975. St. Lucia, Queensland, Australia: University of Queensland Press and New York: Halsted.

Those of us who saw the beautiful Czech film, "Children without love," shown extensively by Dr. Matějček during his visit to the USA, Canada, and Australia in 1968, will be joined by many other readers in appreciation of this excellent, extended treatment of the larger problem of which the film depicted a part. The basic studies and formulation were first issued in Czech in 1963 and 1968. We are delighted to have the enlarged third edition available in a most competent English translation.

Well-written, generously illustrated not only with tables and graphs but with photographs and reproductions of children's significant drawings, supplied with an extensive bibliography of titles in several languages and adequately indexed, this volume should be useful in professional libraries everywhere, for the problem to which it addresses itself is both universal and timely. The treatment of its contents is comprehensive, with historical,

descriptive, and scientific presentation of the physical, social, and psychological aspects of this complex, multidimensional area of child care.

We hear much currently about "battered" and neglected children the world over and on our own doorsteps. We are aware, also, of the increasing need for high quality in day-care facilities to serve children of working mothers, both in the short-term interests of the youngsters and their families and for the long-term social good. This study describes practices in Czechoslovakia and other countries over time, with special emphasis on the middle and later 20th Century experiments with several kinds of plans and facilities for infants, toddlers, and older children. Much has been learned about the consequences, both positive and negative, of a wide variety of practices and experiences from which we can all benefit.

The social and psychological components of deprivation are treated. Among these are: poor opportunities for physical care, social development, and psychological stimulation; inadequate love and support in personal relationships; insufficient cognitive structures to promote learning; and deficient bases for establishing a good sense of personal identity. The nature of the problems analyzed on the basis of experiment and observation suggests a sounder theoretical formulation for understanding, more competent diagnosis of the children affected, and many effective strategies for their treatment in a variety of settings.

The book barely mentions the problem of dyslexia, for that is not its focus, although the authors are well-known experts in this field. We review the book in part because they, our friends, wrote it, but even more because the subject is one about which we who work with children from all walks of life should be much better informed than many of us are.

—MBR

Specific Dyslexia: The Research Report of the ICAA Wordblind Centre for Dyslexic Children, by Sandhya Naidoo. 1972. New York: John Wiley & Sons.

During a decade of activity the Invalid Children's Aid Association (ICAA) of London, England, did much influential work in promoting the understanding and treatment of dyslexia (using at first primarily the term word-blindness). Among its writings it sponsored two influential books. The first volume, issued in 1970, was *Assessment and Teaching of Dyslexic*

Children, by Alfred White Franklin and Sandhya Naidoo, the frequently cited report, historical and practical, of the Associations's 1963 conference. The second volume is the research study, here being belatedly reviewed, of Mrs. Naidoo's work begun in 1966 and brought to publication in 1972, but only recently come into this reviewer's hands. This delay is a source of real regret, for the study is an excellent one, scientifically sound, sufficiently comprehensive, and interestingly written. It should have as wide circulation on this side of the Atlantic as we hope it has in Great Britain and elsewhere, for it will add considerably to the public understanding of dyslexia in its many aspects.

After an introduction to the problem in human, case-history terms, and a discussion of historical and current neurological, psychological and familial perspectives and theory, Mrs. Naidoo presents a research study carried out at the Word Blind Centre of the ICAA under her direction. The study follows a careful design as it analyzes the home and school behavior, the psychological and neurological characteristics, the individual and family histories, and the language learning problems of two groups of middle and upper class boys, 98 of them dyslexic and 84 unselected control subjects. The dyslexic boys fitted the definitions of specific developmental dyslexia with which we are all familiar. They presented no significant problems other than severe difficulties with reading and spelling (56 boys) or moderate difficulties (42 boys) shown primarily by spelling and writing problems. The control boys were of similar intelligence and background but had not been referred for dyslexia.

These groups were of particular interest to me, personally, because in practically every way they closely paralleled the groups in the population I had observed in a single American school in the 1930's and 1940's and on whom I was doing a follow-up study at the time of Mrs. Naidoo's analysis of these present-day youngsters. She has gathered far more data than were available to me retrospectively, but wherever the items are comparable the findings are strikingly similar.

For example, her moderately dyslexic boys and those in the two control groups were very similar in IQ, while her severely dyslexic boys were, although in the normal range, significantly lower in IQ scores. I, too, found this to be the case. On the face of it, this suggests a possible causal relationship between "intelligence" (as measured by Binet or WISC) and the severity of the dyslexia problem. However, because I was re-studying my boys at ages 26–40 I was able to pair them on the basis of life histories with members of the nondyslexic control groups and to demonstrate, in this small

but carefully studied sample, that it was probably the childhood IQ's which were at fault.

Even on individual tests, relatively "bright" youngsters did not do themselves justice. On a "by their fruits ye shall know them" basis, the severely dyslexic boys were just as able as the others. Would that we might know Mrs. Naidoo's boys 20 years hence!

The other findings of this London study verify quantitatively and present clearly one factor after another which those of us who share the neurophysiological approach to specific language disability will find familiar from other studies and empirical observations. The report is enhanced by its excellently clear organization, good experimental design, and the use of modern statistical refinements. We note with interest the collaboration of scientists of such stature as Dr. Alfred White Franklin (who contributes a chapter on neurological factors), Dr. Macdonald Critchley (who examined many of the children), Professors O.L. Zangwill and T.R. Miles (also well known to Orton Society readers), and others equally noteworthy. This is truly a fine little book (165 pages) which we heartily recommend.

—MBR

Reading Disabilities: An International Perspective, by Lester Tarnopol and Muriel Tarnopol (eds.). 1976. Baltimore: University Park Press.

Brain Function and Reading Disabilities, by Lester Tarnopol and Muriel Tarnopol (eds.). 1977. Baltimore: University Park Press.

Editors are often useful people (those of us who act in this capacity keep hoping)—putting writings of other people into readily available form. Sometimes, and this seems to me a valuable involvement, they contribute something of their own in writing, in addition to the selection (and, if need be, the persuasion) of authors and the preparation of their work for publication—no small task in itself, when, as here, it is well done.

The two books brought to attention here are the third and fourth in a series setting forth aspects of learning (and especially reading) problems. The first volume, previously reviewed (*Bull.* Vol. XXI), was *Learning Disabilities: Introduction to Educational and Medical Management,* edited by Lester Tarnopol and published in 1969 by C C Thomas. The second, not reviewed, was *Learning Disorders in Children: Diagnosis, Medication, Education,* edited

by Lester Tarnopol, published in 1971 by Little, Brown and Company. Both were also published in other languages than English.

The first of the current volumes contains papers presenting the "state-of-the-art" in many countries and languages throughout the world, written by nationals of these countries who know whereof they speak—and do that speaking well.

The latest volume was written to meet the needs of university professors to be used as part of courses on learning difficulties. Dr. Lester Tarnopol gives in the first chapter, about as clearly as one can without undue oversimplification, the essential structures and functions of the brain, particularly at the cortical level. Then each of serveral authorities, the best-known being A. R. Luria of Russia, discusses some aspect of the subject of particular interest to him. The final chapter, by Dirk J. Bakker and Jan de Wit of Amsterdam, "Perceptual and Cortical Immaturity in Developmental Dyslexia," is in essence already rather familiar to *Bulletin* readers of Dr. Bakker's writings, but will interest them, nonetheless.

—MBR

Aspects of Reading Acquisition, edited by John T. Guthrie. Baltimore: The Johns Hopkins Press. 222 pp. Cloth and paper.

Inquiry into reading acquisition, reading processes, and reading failure, at one time solely within the province of the pedagogue and later extended to that of the psychologist, now properly demands the attention of the neurologist, linguist, and sociologist as well. Developments in the study of the brain and of language acquisition and processes strongly point to the importance of going beyond psychoeducation and to other disciplines for an understanding of the total process of reading and, especially, for an understanding of *developmental dyslexia.*

These developments also underscore the remarkable insights of Orton who, 50 years ago, differentiated the "special reading disability which serves as a serious handicap to academic advancement in many children" and proposed a neurophysiological, though not a pathological, basis for the difficulty. In so doing, he distinguished these children from those whose failure or delay in reading acquisition stemmed from other factors. It was Orton also who called attention to the "rather high incidence of speech disturbances" encountered in such reading cases, thus linking cerebral organi-

zation, language, and language disorders with specific reading and spelling disabilities.[1]

Aspects of Reading Acquisition, a collection of papers presented at the Fifth Annual Blumberg Symposium on Research in Early Childhood Education at The Johns Hopkins University in 1974 and edited by John T. Guthrie, is an example of current publications that bring together a number of disciplines in the examination of the underlying processes of reading. Taken together, the papers may be seen as a three-fold attempt: to present a model of the loci of the neurophysiological and neuropyschological operations that control reading; to compare the child's acquisition and knowledge of the sound system of spoken language with his acquisition of the written system of language; and to present some of the sociological and psychological substrata of reading failure. The relative merits of methods of teaching reading are discussed and the point is made that there is not, at present, a sufficiently good model of reading acquisition to draw upon for instructional practice. In his introduction to the papers, Guthrie concludes that, ". . . the old notion that educational challenges can be met by direct application of psychological theory is now being recognized as a mirage."

It is appropriate, therefore, that the opening chapter presents the attempt to identify hemispheric localizations for language performance, for it is the brain that controls all human behavior, from breathing to reading. Dr. Frank Benson, an associate of Geschwind, briefly sketches the historical background in the development of the understanding of language disorders that result from brain pathology.[2] Benson identifies, describes and defines those disorders but distinguishes carefully between *alexia*, as an acquired incapacity, and *dyslexia*, as an inherent incapacity, in the comprehension of written or printed words. *Alexia* is further defined within three categories which may have implications for the study of *dyslexia*—primary, secondary and tertiary—each

[1] Samuel T. Orton, "A physiological theory of reading disability and stuttering in children," *New England Journal of Medicine*. 199(21):1046–1052. 1928; also: "Some disorders in the language development of children" (paper presented at the Child Research Clinic Conference, Woods School, 1946) and "Some studies in reading disability" (address at Medical Convocation of the University of Pennsylvania. 1945) in *"Word Blindness" in Children and Other Papers on Strephosymbolia.* Pomfret, Connecticut: The Orton Society. 1966.

[2] For discussion of hemispheric asymmetries and possible relation to language, see: Norman Geschwind, "The organization of language and the brain," in *Science* 170: 940–944, 1970; and "Anatomical evolution and the human brain," in *Bulletin of the Orton Society* 22: 7–13, 1972.

with specific manifestations in language disorder and related to specific neuroanatomical structures. It would appear that primary *alexia* is directly associated with visual-sensory disturbance; tertiary *alexia* with disturbances of motor speech and eye movements; while secondary *alexia* seems to be associated with disturbance in language comprehension and with auditory association. Benson suggests that secondary *alexia* is a disturbance of integration, *i.e.*, associating the visual input of the written word with the auditory knowledge necessary for semantic comprehension.

Although Benson does not state or imply that the knowledge of language functions in the brain, gained through studies in brain pathology, has any direct or immediate application to a greater understanding of reading acquisition, he nevertheless considers that it points to directions that might be fruitful. He proposes that the anatomical areas noted in the study of reading disturbances that result from brain pathology may be those areas that are important for the developing child; it may be that structural abnormalities in those areas interfere with the acquisition of reading.

There can be no quarrel with Benson's proposition; obviously, it is of first importance to identify the anatomical seat of language, spoken and written. On the other hand, it is by no means yet clear that failure or delay in reading acquisition is due to structural abnormality. Benson does not bring into the question the noted occurrence of familial *dyslexia.* He fails, therefore, to consider genetically determined structural *differences,* rather than abnormality, as a possible impediment to reading acquisition in some cases.

In contrast to Benson, Doris R. Entwisle provides a focus on some of the social variables that affect reading acquisition in the young child. Social conditions, in home and school, produce psychological effects that determine the child's cognitive state, attitudes, degree of self-esteem, and expectations. The data that Entwisle presents in support of her thesis, though still incomplete, seem to point toward a discordance between expectation of reward and actual reward as a correlation of poor reading performance, especially in lower-class children. In addition to the factor of the child's expectation, Entwisle notes the additional one of the parent's expectation in correlation to school absences. Time spent in school is less for children whose parents hold low expectations.

Entwisle concludes by implying that the key to learning to read may be the sheer time spent. "If a child spends less time because he is late or absent or if he effectively fails to use feedback to monitor his own performance, there may be less time for learning." This is a sensible statement and, no

doubt, one that can be applied to many children who do not achieve in school. But it fails to account for the lack of reading acquisition by children who maintain full attendance, who have a high level of ability, and who have good parental support and expectation.

It is these children that Paul Satz and his associates, Janette Friel and Fran Rudegar, are attempting to identify for purposes of intervention prior to school failure. For this purpose, they use a developmental neuropsychological test battery in order to forecast, during the kindergarten year, reading achievement in subsequent years. The paper in this volume covers the two, three and four-year follow-up studies that are part of a longitudinal review to test the validity of the battery.[3]

Satz is attempting to test a "theory that purports to identify the predictive antecedents of developmental dyslexia" prior to when the "disorder is clinically evident" and "to evaluate the mechanism that is postulated to underlie and influence later developmental changes in this disorder." Satz's theory postulates a maturational lag in the brain as the basis of developmental dyslexia. The skills that ordinarily develop in early childhood and are the pre-requisites for learning to read are delayed. The children destined to become severely disabled readers four years after kindergarten, Satz reports, lagged considerably behind those destined to become able readers. Their delayed development was shown on the predictive test battery in visual-motor integration, somatosensory integration, perceptual discrimination, auditory discrimination, and verbal-cognitive processing.

Satz interprets his data to mean that specific reading disability cannot be explained as a primary lag or defect in one particular modality. At present, he is prepared only to state that ". . . the concept of a developmental readiness seems to represent the most parsimonious and least pernicious way to describe these behavioral differences (precursors) that characterize children destined in later years to extremes in the reading distribution." A lag in the maturation of the cerebral cortex must still be treated as a hypothetical construct.

Marcel Kinsbourne also presents a test battery but his purpose differs from that of Satz. Kinsbourne's battery covers visual, auditory, and associative functions that are essential for beginning reading. The battery has

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[3]The third year of the longitudinal study was reported by Satz and Friel with Ron A. Goebel in the *Bulletin of the Orton Society*, Vol 25, 1975. See "Some predictive antecedents of specific reading disability: a three-year follow-up," pp. 91–110.

resulted from an analysis of the operations involved in beginning reading and is used to evaluate the competency of the beginning reader for a performance of those operations. Kinsbourne states that if it is possible ". . . to determine the stage a child has reached for each mental operation necessary for reading, we will be able to specify the particular processing problem that besets a particular child." Kinsbourne cautions against use of the battery of tests for prediction of future performance and emphasizes its use as a guide for instruction. A child who does not "hit upon a (learning) strategy spontaneously" may be able to use that strategy if shown how.

Both Satz and Kinsbourne are aware of difficulties in long-term prediction based upon the young child's maturational stage. Satz, despite his reluctance at this time to go beyond a hypothetical construct of maturational lag in the young child, nevertheless includes the older child in his theory with the notion that "lag in brain maturation (genetic or otherwise) will delay the acquisition of the developmental states in thought for the dyslexic child." If the dyslexic child eventually "catches up" on the earlier developmental skills, he will still lag in the "later-developing cognitive language skills that unfold from the preceding stages of concrete perceptual operations. Indeed, unless the child catches up by that time in later childhood "when the brain is reaching full maturation," he will have "more permanent delay in language and reading skills."

Kinsbourne, on the other hand, recognizes that a wide range of new operations become possible because of cognitive development between the ages of five and seven. The older child, however inexperienced, will spontaneously hit upon new strategies or will use a strategy when shown how and thus achieve the educational goal. Although Kinsbourne acknowledges the persistence of reading difficulty in some, he views the nature of the limitation on performance as changing over time. By use of the test battery to identify the child's operational mode, the instructor is enabled to supply the learning strategies that the child fails to generate.

If the child must develop specific learning strategies, toward which specific skills in reading acquisition and in which order should those strategies be directed? S. Jay Samuels addresses the question of whether the components of reading, the subskills, can be ordered within a hierarchical arrangement. He briefly reviews the *part versus whole* and *skills versus meaning* debates and concludes that it is not so much the *what* as it is the *when* in the teaching of reading. He counters the contentions of those who believe children learn to read only by reading and not by being taught the "mechanics" by pointing out that complex skills are built upon simpler skills. Success-

ful attainment of the final task of meaningful reading, a higher-order skill, may be facilitated by mastery of the lower-order units.

Is there a known hierarchy for reading? The question, still not answered, has been much debated. There is, however, a consensus on one aspect of the debate: reading is a highly complex task. Samuels suggests that lack of agreement on a reading hierarchy may be the result of educators having assumed *one* hierarchy and *one* way to sequence subskills. He proposes that a more fruitful path to pursue is one that would take us through a series of "terminal" behaviors (*e.g.*, the ability to pronounce a new word) with the necessary subskills (*e.g.*, left-right visual processing of letters, letter-sound knowledge, and sound blending) in an A, B, C order.

Samuels concludes that in the absence of validated learning hierarchies we still have a "fairly good idea of what the necessary subskills may be." We can hardly quarrel with Samuels on this statement; it does not require a research project to discover that if a child cannot relate alphabetic symbols to speech sounds and words, he cannot derive meaning from printed language however competent he may be with spoken language.

In another chapter, Lauren B. Resnick and Isabel L. Beck offer some hypotheses for the construction of models of task analysis that would, if accomplished, develop hierarchies of reading skills and result in the teaching of component skills. Resnick and Beck take for granted what Samuels questions, that there is the adequate knowledge for establishing a hierarchical model of reading that encompasses all stages in the process from "decoding" to comprehension. Using a computer model of information processing, they offer diagrams to illustrate scanning, subroutines and retrieval to reach the target knowledge, whether grapheme classification or reading comprehension.

Resnick and Beck propose that the psychological theory underlying the computer model of information processing can be used as the basis of instructional strategies. The computer model is indeed a tempting one; perhaps when we know as much about the human brain and language as we now know about computers, we will be able to program children's learning.

That we are still far from that knowledge is made clear by Paula Menyuk's discussion of the acquisition of oral language and its relation to the acquisition of reading. She reviews the assumptions of similarities between the two and carefully distinguishes the differences. She makes clear that the nature of correspondences is presently a matter of speculation and further research with substantive findings is needed to elucidate the proposed similarities.

As to the beginning reader, the assumption is that the initial reference is

to the phonological component of grammar whether the approach is through sound-symbol correspondence and synthesizing the segments into the word or through the "look-say" match to the word. Whatever the method, if reading involves categorization of letters, segmental synthesis and translation into a phonological sequence, then Menyuk sees an immediate difference between processing strategies in speech acquisition and the comprehension of written language. In her discussion of speech perception, she demonstrates that the process appears to be one of coming to segmental analysis only if necessary. In the acquisition of reading, however, segmental analysis is presumably the first step.

In a number of instances, too numerous to detail here, Menyuk draws distinctions as well as seeming parallels between speech and reading acquisition. Of particular interest, perhaps, is Menyuk's citing of the infant's ability to distinguish between speech and nonspeech presumably using suprasegmental and segmental features and obtaining feedback through babbling. In comprehension of the written system, the child appears to distinguish between writing and other marks on paper and appears to use both organizational and segmental information. Categorization of segmental sequential features are required in both of the language processes.

Menyuk suggests that the ". . . processes of speech perception and of written language appear to be inverse to each other in sequence of analysis during acquisition; speech perception proceeds from meaning to analysis whereas written language comprehension presumably proceeds from analysis to meaning. . . ." Menyuk points out that speech analysis takes place at the unconscious level and in units of syllables but that conscious awareness of phonemic segments is required for reading acquisition. Successful readers, states Menyuk, appear to spend relatively little time on this stage, going quickly to the use of the phrase and the sentence, whereas unsuccessful readers seem to spend a considerable amount of time on the preliminary stage with some never achieving the meaning stage. Menyuk's suggestion may account for the fact that dyslexic children, on the whole, seem to benefit from instruction that deliberately develops the conscious awareness of phonemic segments and then the syllabic units prior to the stage of reading for meaning.

Guthrie has performed a valuable service in bringing together the disciplines represented in this volume. Inquiry and analysis of the many factors involved in reading acquisition may eventually shed more light not only on how children learn to read but also on how some children fail to do so. While

this volume enlightens us in some respects, it also shows us the long road ahead.

—Alice Ansara

Speaking of Children: Their Learning Abilities/Disabilities, by Careth Ellingson. 1975. New York: Harper and Row.

In 1967, after a somewhat meteoric rise from a 1963 introduction to dyslexia as a "nonprofessional" and the discovery of her own title to this diagnosis, Careth Ellingson wrote *The Shadow Children* (see review, *Bull. of the Orton Society*, 1968) because she felt it "had to be written." She was full of love, enthusiasm, new knowledge not fully digested, and journalistic facility. Despite its short-comings, *The Shadow Children* was useful in calling the attention of the lay public to the plight of the dyslexic child.

Mrs. Ellingson is an avid student, a learner, and a thinker. This time around she has produced a far better book, with a positive, forward look (note its sub-title). She is just as loving, concerned, enthusiastic, and persuasive, and expresses herself as fluently, but her information is broader, deeper, and more accurate. Her minor flaws of scholarship, too, have all but disappeared. She still, to our way of thinking, mixes levels of sophistication in the material she presents and, while cautioning against home-diagnosis, includes tests which parents can seldom use, and long lists of characteristics which might prove confusing. Still, this seems to be common in messages to parents—an attempt to help them to know whether they have identified a real problem. Perhaps she might better have used some of the space she gives to details of testing to filling in more background for the understanding of the nature of the problem?

She has strengthened her *caveat* against espousal of panaceas and her advice in favor of consulting experts—especially in the field of chemotherapy. Her educational philosophy and her detailed description of the practices in a single specialized school make a vivid and convincing case that for effectiveness there is no substitute for individualized education.

Her reading list for parents is confined to a listing of more and less pertinent journals; we should have liked some titles of introductory books, too. Still, this should be, itself, a good introductory book to have available, for there is much that is wise and informative between its covers.

—MBR

Home Is a Learning Place: A Parents' Guide to Learning Disabilities, by Helen Ginandes Weiss and Martin Weiss. 1976. Boston: Little, Brown and Co.

The Weisses have lived with learning disabilities (not only dyslexia) in their own family and among the adults and children they meet as counselors. This is a book for parents—a compound of description, analysis and the specifics of helping. Each parent will take from it what he or she can use, but from reading it all will gain increased empathy with learning-disabled young people and their elders.

—MBR

Home Guide to Early Reading, by Toni S. Gould. 1976. New York: Walker & Co.

Toni Gould believes that children should be taught to read early—say at 5, or even 4, but not at 2 or 3! If, as "natural readers," they have reached the "critical period" of interest and development in the preschool years, systematic, appropriate teaching will help to make sure that they become neither "guessers" nor nonthinking "word-callers," but intelligent masters of the skills of literacy. If, on the contrary, they are not "ready" for beginning to read, it is doubly important that they be taught in those areas of "readiness" in which they have needs. Just waiting for nature to take its course may be too hazardous for them. This positive help is the best way, says Mrs. Gould, to prevent language problems from developing in the school years. Either way, parents, teach your child if you can. It will be a happy, rewarding experience for you all. If you can't, for reasons of time or temperament, then find a substitute, with whatever expertise is needed. (Mrs. Gould believes in experts, too.)

Her preferred method is structured reading, a "modified linguistic" approach, which seems to us just like those variations of the Orton approach which emphasize sounds, rather than letter names, for alphabetic symbols (s' e is very positive on this point), and which begin with manuscript, rather than cursive, writing, and are otherwise quite in line with her thought and practice. She acknowledges kinship with Montessori, but does not mention Orton or any of his successors. Still, whatever her sources and enthusiasm for a single set of reading texts (Stern, Gould and Stern), we find most acceptable her structured, multisensory recommendations for combining the several

language skills, basing teaching on the realities of English, and expecting children to learn to think their way through, using intelligence rather than rote learning or magic.

Her many readiness games and her teaching strategies are lively and practical and her lists of books for reading aloud and, as a beginner, to oneself are splendidly useful. From this reviewer's point of view, her biases, if such they be, are usually in the right direction (our own, of course!) and her book is a welcome addition to our working library.

—MBR

Language Perspectives—Acquisition, Retardation and Intervention, edited by Richard L. Schiefelbusch and Lyle L. Lloyd. 1974. Baltimore: University Park Press. Cloth. 670 pp.

Language Perspectives: Acquisition, Retardation and Intervention is an important addition to the literature in its field. It contains 17 papers plus the discussion summaries presented at the Chula Vista (Wisconsin) Conference of 1973 under the sponsorship of the National Institute of Child Health and Human Development. Ably edited by Schiefelbusch and Lloyd, *Language Perspectives* merits the attention of every scholar, researcher or practitioner who seeks increased knowledge and understanding of language processes and language disorders in general as a possible route to greater understanding of specific disabilities in written language.

Too many papers and too many complex issues, however, prohibit a comprehensive review in the limited space available here. Paula Menyuk, for example, raises what is essentially an issue central to the entire discussion: Can we identify prerequisites to the teaching of language for language-retarded or language-disordered children? What is normal acquisition and development? The conference papers reveal a consensus on the fact that answers to the second question will lead to a response to the first and to a proper way for language intervention. A number of papers address this central issue.

Related to it is another important issue that concerns speech perception by the infant. Peter Eimas suggests that a feature detector model may explain the ability to perceive phonetic features in a speech mode. He also suggests that this feature detection in the infant may not actually differ from that in the adult. But this issue raises another, the difficulty in research with infants.

Not only is there a high dropout rate of infants in the research, but certain questions still remain to be answered in the interpretation of findings in infant responses.

One of the questions to be answered is whether there are individual differences among individuals in speech perception and, perhaps, also in feature detection. If there are such differences, an interesting speculation is whether this might relate to some innate factors that in older children lead to differences and/or difficulties in matching visually perceived symbols to critical features in speech as must be done to interpret written language.

Another issue brings an emphasis to the interactive nature of cognitive and language development. Eve M. Clark, I. M. Schlesinger, Donald M. Moorehead, and Ann Moorehead discuss the conceptual basis for language acquisition. There appears to be general agreement that cognition and language are the result of a common system of processes in the Piagetian sense. Language development is seen as linked to the emergence of the symbolic function in the child's development; the ability to represent one thing with another is viewed as one of the fundamental prerequisites for language acquisition. A child with difficulty in the basic process of symbolizing will have problems with language. Although not impaired in basic intellectual and logical development, such a child will do poorly in tasks that involve imagery.

Still another important issue is the developmental relationship between receptive and expressive language. As in the discussion of other aspects of research in language acquisition, the discussion of this relationship by Lois Bloom and David Ingram reveals the difficulty of study. For example, in the evaluating of comprehension of language, the children's responses may be determined by many things in addition to what they hear. Furthermore, it may be difficult to draw inferences of concepts held by a child if there is deficiency in the child's productive language. There seems to be general agreement, however, that in children with language disorders, there may often be a lag in production as compared with comprehension.

Among many explanations for the disparity between production and comprehension, one refers to memory factors that affect recognition and recall. Other explanations call attention to the knowledge of extra attributes needed for reproduction as opposed to recognition or for an intervening mental reconstruction of an image as the basis for reproduction. For those readers whose primary interest is in specific disabilities with written language and who are often dismayed by the lag in spelling as compared with reading in remediation, a statement by Lois Bloom (p. 300) offers the opportunity

for a speculative analogy to be drawn between spelling-reading and oral production-comprehension.

> The memory load for saying a sentence is presumably greater than for understanding, inasmuch as the individual needs to recall the necessary words and their connections to say them, but these linguistic facts are immediately available to him when he hears them spoken by someone else. The child can experience a sentence as more or less independent of its parts, but saying sentences involves bringing together the elements to form a whole. In recognizing a word or a sentence, a child relates what he hears to existing perceptual schemas, but saying the word or sentence involves reconstructing an intervening representation in the form of a "symbolic image."

In other words, if speaking involves more complex processes than the understanding of spoken language, so might spelling in comparison with reading.

In discussing comprehension of language, Bloom points out how much can be obtained in a non-linguistic context, that is, meaning can be gotten out of a non-linguistic environment. This, too, probably relates to the difference between writing and reading. While both are within a linguistic environment, the latter provides the linguistic context; in the former, the speaker-writer must supply the linguistic context.

Another section of this volume deals with language training and teaching strategies. A number of intervention programs are described and illustrate the attempt to integrate various approaches. Overall, it is a developmental view that emerges and emphasizes dependency of one level upon a prior level for acquisition of aspects of language.

Schiefelbusch summarizes the major findings of the conference in ten briefly worded points. Mainly, they deal with language training and these rest upon two underlying themes:

1. The field of language research, including research on acquisition and intervention, has bridged the cognitive and behavioral domains. The functional effect of this emerging synthesis is a more comprehensive paradigm.
2. Early intervention tactics should be based upon what is known about early acquisition. This covers early conceptual development, semantic precursors to formal syntax, and, finally, the emergence of receptive and productive language.

Schiefelbusch concludes his summary with the statement that many are involved in "... slowly mapping a process that may eventua'ly help most, if not all, children to experience the joy of communicated feelings, thoughts, and impressions." The participants in the Chula Vista Conference and their published papers have made an important contribution to the map that will emerge in the future when the unknown "seas" of language will have been full charted.

—A.A.

Interactive Language Development Teaching: The Clinical Presentation of Grammatical Structure, by Laura L. Lee, Roy A. Koenigsknecht, and Susan Mulhern. 1975. Evanston, Illinois: Northwestern University Press. 428 pp.

In *Interactive Language Development Teaching,* Laura Lee and her associates present an intervention program for children with language learning problems. The teaching procedures, used in a clinical group setting, are based upon Lee's earlier work in developmental sentence analysis. They present grammatical structures in what the authors consider to be an approximate simulation of the conversational setting of normal language development. Story presentations, clinician's questions, children's elicited responses, and a period of activities related to the story make up each 50-minute session. One might debate the authors' view of narration, question, and response elicitation as a simulation of what is normally the conversational environment in which language develops. The procedures resemble those often used in second-language teaching.

Aside from a short presentation of the rationale for the teaching procedures, the main body of *Interactive Language Development Teaching* is comprised of the language development lessons, followed by a brief description of the experimental work and its findings. The sequence of lessons given is the one followed in the experimental work and is closely linked with Lee's Developmental Sentence Scoring (DSS) technique.

The clinical treatment was given to 25 language-delayed children who were all monolingual, from middle class homes, within the normal range on selected intelligence measures, and who had no hearing or neuromuscular problems. Age ranged from three years, two months, to five years, nine months. The mean delay in grammatical development for the 25 children in their pre-treatment language sample, as estimated with DSS procedures, was

21 months. The mean treatment interval of all the subjects was 8.3 months, with four sessions weekly over 32 weeks.

Post-treatment measurement showed a mean gain per child of 10.8 months on the estimated age-equivalent score for the DSS in the use of morphological forms and syntactic structures in spontaneous language usage. Assuming that the DSS yields reliable estimates of age-equivalent scores in such minute increments as months in the child without language delay, then the clinical population showed a mean gain of 2.5 months beyond normal expectation.

The authors believe that the use of the DSS and the teaching procedures helped the clinical population to "match and exceed the rate of progress of normally developing children who are at the same general stage of grammatical development." Two questions, however, must be raised with regard to this statement. First, what was the language experience encountered by the subjects at home and/or at school? No data is given with respect to this question. Were all or some of the children attending nursery school or kindergarten? Did some children have older siblings and others not? Second, would a control group of normal language-development children, exposed to the same treatment, have made the same or greater or lesser mean gain? Or would a non-treatment group of children, matched for language delay, have provided the control needed to determine if, in fact, the teaching procedures used were an effective means of intervention? No control groups were used.

In fact, knowledge of the development of syntax in normally developing children is limited; there is even less known about the syntactic behavior of language-delayed young children. Any effort at developing that knowledge and any effort toward intervention with language-delayed children must be welcomed. Nevertheless, some caution about premature conclusions is warranted prior to widespread and uncritical use of evaluation and intervention procedures for these children. This caution may be particularly important at the present time because of two factors: the growing recognition that early language disorders may be significantly related to specific language disabilities in school-age children; and the recently enacted federal legislation for handicapped children.

With the Education of Handicapped Children Act of 1975 (PL 94–142) in force, the mandate for identification and intervention as early as age three will undoubtedly stimulate the development of many programs at state and local levels. Certainly such programs for language-delayed or language-disordered children are not only desirable but an absolute necessity. But errors

of the past should be avoided if possible. Earlier federal legislation, in learning disabilities for example, stimulated the initiation of many programs that were based upon shaky foundations in theory and design. Lee and her associates would perform a valuable service for language-delayed children if they would replicate the investigation reported in *Interactive Language Development Teaching* but with more extensive data gathering and reporting, and with control groups. A future edition of this book would also be improved by the inclusion of a bibliography not limited to the test references and to the papers of the authors as is the present one.

—A.A.

Grants: How to Find out About Them and What to Do Next, by Virginia P. White. 1975. New York: Plenum Press.

Ms. White, director of the Office of Sponsored Research at the Graduate School and University Center of the City University of New York, is obviously no novice at "grantsmanship," and in *Grants* she gives ample demonstration of her knowledge of its intricacies.

Grants provides the basic information about what a grant is, what its potential sources are, and how to go about getting it. It is comprehensive in its wealth of detail about governmental and non-governmental sources, applications, proposal writing, and how grants are awarded. Its excellent organization initiates and guides the neophyte into and through the labyrinthian world of grant-seeking and grant-awarding. Embellished with humor, signposts along the way mark pitfalls and needless detours as well as the desirable paths.

Eight appendices, an index, lists of source books and other publications, and excellent illustrations—budget guides, for example—are in addition to the information packed chapters.

For everyone who contemplates beginning a search for funds for a project or study—from small workshop to long-term research—this book is essential reading and study.

—A.A.

Financing Educational Services for the Handicapped: An Analysis of Current Research and Practices, by C. D. Bernstein, M. W. Kirst, W. T.

Hartman and R. S. Marshall. 1976. Reston, Virginia: The Council for Exceptional Children. Paper. 68 pp.

The authors of this study have succeeded in gathering together an extraordinary amount of information related to special education finance. Those who must determine policy as well as those concerned with program design in various aspects of special education will find this document extremely helpful.

Along with policy considerations, there is practical information on programming, cost determination, level of funding and funding formulas. Some 60 or so abstracts of papers and other publications covering areas pertinent to the report are included in one section. Editorial comment following each abstract will assist the reader in determining its relevance to a particular interest or inquiry.

—A.A.

Public Policy and the Education of Exceptional Children, edited by F. J. Weintraub, A. Abeson, J. Ballard and M. L. LaVor. 1976. Reston, Virginia: The Council for Exceptional Children. Paper. 378 pp.

It is no longer possible for educators concerned only with problems of *dyslexia* to focus on cause and cure alone. Recent changes in the schools, precipitated by the courts and by federal and state legislation, require attention to program planning and procedures as well. *Chapter 766* (the Massachusetts legislative act for special education), *PL 94–142* (Federal Education of the Handicapped Act of 1975), *accountability, least restrictive environment*—these and many other terms and phrases have entered the lexicon of educators at all levels, in universities, schools, and clinics. Language therapists, along with school psychologists, classroom teachers and others, serve as part of the learning teams for evaluation, prescription, and reporting. It is rapidly becoming essential for everyone involved in any aspect of special education to be fully informed on current requirements stemming from court rulings and legislation.

The editors of *Public Policy and Education of Exceptional Children* have performed a much-needed service. They cover the important aspects of public policy in this area through well-written overviews and carefully selected papers by 16 other contributors. Organized within five sections, papers and overviews provide information and interpretation of the following: *educational rights of children; state and federal policy for exceptional children;*

avenues for public policy change; understanding the policital process; and *professional rights and responsibilities.*

In addition to a listing of all federal laws for the handicapped enacted from 1827 to 1975 and identifying the purpose of each, the most recent and most comprehensive one, PL 94–142, is given in detail. This is the law that will concern most *Bulletin* readers.

–A.A.

Some Recent Publications of the International Reading Association

Theoretical Models and Processes of Reading, 2nd edition, edited by Harry Singer and Robert B. Ruddell. 1976. Newark, Delaware: International Reading Association. Paper. 758 pp.

Theoretical Models and Processes in Reading, first published in 1970, is one of the publications on reading in a series that has resulted from the impetus provided by the National Institute of Child Health and Human Development since its establishment in 1963. *Bulletin* readers are probably already familiar with *The Reading Process,* edited by J. F. Kavanagh (1968) and *Language by Ear and by Eye,* edited by Kavanagh with I. G. Mattingly (1972).

Approximately 75 percent of the selections in this edition are new. Bringing together published papers from many sources, the articles are grouped to provide focus upon three areas: processes, models, and issues in research and teaching.

Appropriately, the three main sections are preceded by an introductory section in which Constance M. McCullough identifies a key problem: bringing researchers and teachers into communication. John B. Carroll's provocative "The Nature of the Reading Process" poses questions that researchers and teachers together must answer.

Taken as a whole, *Theoretical Models and Processes in Reading* brings to the forefront old knowledge and new knowledge about reading, and old questions as well as new questions. It identifies many of the areas in the reading process and in the teaching of reading that still require elucidation. *Bulletin* readers will find it an excellent source for encountering current

concerns about reading and some of the models that are emerging from those concerns.

—Alice Ansara

Teaching Reading and Mathematics, by Richard A. Earle. 1976. Newark, Delaware: International Reading Association. Paper. 88 pp.

Improving Reading in Science, by Judith Thelen. 1976. Newark, Delaware: International Reading Association. Paper. 54 pp.

Teaching Reading and Mathematics and *Improving Reading in Science,* two new titles in the Reading Aid Series of the International Reading Association, should be in the hands of every therapist and every teacher of school mathematics and science who works with reading disability students in the middle and upper grades.

For the therapist who moves the student through the acquisition of basic skills in the knowledge of word structure and into reading for meaning and new knowledge, these two publications will demonstrate forcefully the need to provide the student with many and varied strategies for the reading of continuous prose. Using fiction alone to provide the opportunity to apply the "decoding" skills, to develop reading comprehension, and to increase reading interest and motivation is not enough. While general literature may serve all of those purposes and, indeed, may be necessary and desirable first readings, the reality of the textbook in the classroom must still be confronted. A textbook in mathematics or science bears little resemblance to fiction, drama, biography or even essay.

Both mathematics and science have unique vocabularies. Both often display high density in text. Each has its own prose style. Each calls for unique ways of reasoning while reading. And the formats of the textbooks are necessarily designed differently from the general literature or from a text in social studies. For the student who formerly could not cope with courses because of a lack in fundamental reading skills, the therapist cannot take for granted an ability to transfer newly gained skills to the special requirements of texts in mathematics and science.

If the goals of concept attainment, factual knowledge and application are to be reached for all students, the subject teacher who incorporates textbooks into the instructional design must also incorporate the teaching of appropri-

ate reading skills, strategies, and vocabulary. There is today little quarrel with this notion, as may be attested by the requirement in many states for preservice and inservice training of teachers in the teaching of reading in the content areas.

Instruction in reading in the content areas is recognized as desirable for most students; it is imperative that it should be recognized as an absolute necessity for dyslexic and other backward readers. Language therapists and classroom teachers can enhance their understanding of the teaching strategies required through a study of both *Teaching Reading and Mathematics* and *Improving Reading in Science.*

A. A.

Attitudes and Reading by J. Estill Alexander and Ronald Claude Filler. 1976. Newark, Delaware: International Reading Association. Paper. 73 pp.

Attitudes and Reading, included in the 1976 Reading Aid Series of the International Reading Association, performs a valuable service. It reminds us that reading is affective as well as cognitive in nature and that, although attitudes toward reading are highly personal, a positive attitude is nevertheless an essential ingredient. Equally important, this monograph reveals how limited and contradictory reading research is insofar as it concerns attitude development and maintenance. It should be obvious that this aspect of reading demands the attention of scholars and practitioners.

Despite the limitations of the research, however, it does appear that ". . . student self-concept and interests and the attitudes and behaviors of parents and teachers may affect attitudes toward reading." Alexander and Filler fail to address specifically the effect on self-concept and attitude of a delay or great difficulty in reading acquisition and/or development. Yet it should be self-evident that children who fail in reading in the early grades because of a specific language disability or other factors—social, psychological or environmental—are at a severe disadvantage in the succeeding years. Moreover, they will be additionally affected by attitudes of parents and teachers who do not understand that the basic problem is not merely one of motivation.

While many of the suggestions offered in this monograph may serve to heighten interest in reading and to improve attitudes in many children, these suggestions can apply only to those who have, in fact, already acquired the

240

minimum skills. Indeed, for those who do not already have the minimum skills or for whom reading is still a laborious task, the suggestions for assessing and improving attitudes may add to the existing discouragement.

Attitudes and Reading can be extremely helpful to teachers provided they are also fully informed as to how to differentiate between attitudes fostered by a specific disability in reading and those that stem from other factors.

—A. A.

Research in Children's Literature, an Annotated Bibliography, compiled by Dianne L. Monson and Bette J. Peltola. Newark, Delaware: International Reading Association. 1976. Paper. 96 pp.

Research in Children's Literature contains four sections: dissertations and Educational Research Information Center (ERIC) documents; journal articles; related studies; and an index that provides a means of identifying relationships among the studies.

The section on dissertations and ERIC documents includes doctoral studies reported in *Dissertation Abstracts International* between 1960 and 1974 and ERIC documents dealing specifically with literature for children and adolescents. It provides good resumés and should be useful not only to the scholars and researchers for whom it is intended but also for practitioners, teachers of English and reading, who wish to broaden the base of their knowledge and understanding in this area. A total of 177 studies is given in this section with summaries that include information about subjects, instrumentation, findings, and type of study. The studies include a wide range of topics, from content of books to effect upon children, from effects of curriculum to effects of teacher planning, and from attitudes of readers to the influence of literature on the self-concept of the reader.

The second part contains a bibliography, without annotation, of 108 reports of research in children's literature, published in journals from 1965 to 1974. The range of topics is too great to classify or enumerate here but the titles suggest many of the questions that teachers have about children and the literature offered to them.

In the third section, the bibliography includes an additional 48 titles of studies that are related to those previously listed but that do not fall into the same categories. Monson and Peltola, however, consider their inclusion warranted because of their potential interest to educators and researchers.

Part 4 contains an index designed to help the reader locate studies within the bibliography according to information about the characteristics of subjects, instruments used, and the general content. Studies are grouped together by number so that the reader is directed immediately to all the studies that share a particular characteristic.

A concern for children's literature may be a considerable distance away from the language therapist's concern of the moment—teaching a dyslexic child that graphemes represent phonemes that can be blended into words, words in print that can expand the mind and emotion. But once that goal is accomplished, it is replaced by another—reading as both cognitive and affective behavior. Children's literature then does become the concern of the language therapist as well as that of the classroom teacher. *Research in Children's Literature* can serve as a guide into the research that attempts to identify the effects of many factors in the interaction of children and literature.

—A. A.

INVITED ESSAY REVIEW

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On Being Human: A Systematic View, by G. Marian Kinget. New York: Harcourt Brace Jovanovich. 1975.

The Immense Journey, by Loren Eiseley. New York: Random House. 1946.

The Lives of a Cell: Notes of a Biology Watcher, by Lewis Thomas. New York: The Viking Press. 1974.

Man, mind, language, time, the unity and mystery of life are the subjects of these three scientist-scholar-philosopher authors, each of a different dis-

cipline. For each, consideration of any one of these topics leads invariably to discussion of the others and thence to speculation on larger realities than the mind of man may apprehend. Especially in this 21st century world of lost and losing souls, their statements so different, and so much the same, are to be read again and again, in deep quiet, with special precaution against interruption, as much to savor the poetry of the style as the import of the content.

Eiseley,* naturalist, anthropologist, paleontologist, specialist in evolution, "a man preoccupied with time," traces "the long trail of life" from the primordial slime to Man. He stops here tenderly to examine the "thin blue skeleton of a hare tumbled in a little heap [to] marvel now, at the wonderful correlation of parts, the perfect adaptation to purpose, the individually vanished and yet persistent pattern . . . now hopping on some other hill;" and stops there ruefully to lament our habituation, "There is nothing in the world to encourage the idea that our surroundings are dull, with ourselves quite ordinary creatures." And sometimes he rouses from his gentle style to startle by emphatic judgment, "Of men elsewhere and beyond, there will be none forever . . . in the nature of life and in the principles of evolution we have had our answer."

Eiseley's immense journey takes us far back to the first stirrings of life: The brain-which-became-man's began not in the deep but at the shores of the pond and in tidal estuaries, its development powered by desperation and adversity—the fight for oxygen in mud-caked pools, with a consequent "thin-ness" of brain tissue, fed from without and within, to become "the most remarkable creation in the world," a "unique time-spanning brain," "capable of drawing into its strange, non-spatial interior that world of infinite and multitudinous dimensions [the galaxy]."

No simian brain, this, Eiseley stresses (and speaks at length about the "abyss which yawn(s) between man and ape"), but not Man either. Though "brain is the really important specialization," he reminds us that man is totally dependent in the achievement of human status upon the careful training he receives in human society . . . he cannot develop alone . . . ," for man, the "user of speech," the symbolmaker, is by definition a *reflective* animal, one capable of contemplating himself, of calling up the past and speculating on the future, who has "crossed over" from the eternal present of the animal to a "new invisible environment" driven by what Thomas calls a

*Loren C. Eiseley died July 9, 1977.

biologically determined urge to share information, to communicate, for whom now "communication meant life . . . (and who is not made) truly human until in infancy, the dreams of the group, the social constellation . . . had been implanted in the waiting receptive substance of his brain," a "social brain."

But the changes across the tides of evolution did not occur as a result of ruthless selection out, the triumph of "fit" over "unfit." This Eiseley states was a distortion against the backdrop of ruthless Victorian industrialism. With Dr. Thomas, he stresses that life is by its nature cooperative. "It is likely that the selective forces working upon the humanization of man lay essentially in the nature of the socio-cultural world itself," man making and shaping himself. "With every advance in language, in symbolic thought, the brain paths multiplied," man and his language each the necessary condition of the other.

From cell to complex organism, nevertheless, Eiseley reminds us of the unity of life. Man, brain, cell: each "a concentration of that indescribable and liquid brew which is compounded in varying proportions of salt and sun and time . . . at whose heart lies water . . . myriad, detached little ponds with our own swarming corpuscular life . . . walking sacks of sea water," held together by that "mysterious principle . . . *organization*" which elsewhere he suggests may be "the divine blueprint," drawn by "the careful finger of God." This restless force, life, "secret," "inscrutable," the mystery of which "will not be solved," is dynamic, reaches out, continues to evolve on a larger more complex pattern than Man may ever comprehend . . . "The essence of life in its great dealings with the universe."

It is primarily with the cell that Lewis Thomas, biologist, pathologist, and comparative linguist** starts and stops, but like Eiseley his considerations traverse time, space, and eternity. His immense journey is contained in the walls of a single organism, but its path leads from the virus, through man, to the biosphere.

Where Eiseley is fascinated with historical time, reptiles and mammals, Thomas focuses on present time, insects and ecosystems. Each utlimately is discussing man. Each sees him "embedded" in nature. Eiseley's focus is along a straight line; Thomas's path is circular. Eiseley's "walking packs of sea water" are vast cooperatives, habitats, in Thomas' metaphor, in which the tenants, quite separate entities, are masters: "At the interior of our cells,

**An irresponsibly amateur linguist, he says.

driving them . . . are the mitochondria . . . little separate creatures . . . replicating with their own DNA and RNA quite different from ours . . . symbionts . . ."

But these are not the only invisible "strangers" in the human house. Others Thomas says, "a good many others . . . centrioles . . . basal bodies . . . others . . . [are] established in [the] cells . . ." " sorting and balancing me, clustering together." Our genes carry instructions "from all kinds of sources in nature" putting the lie to the illusion in man that he is a separate entity.

Whether by discussing slimemold, ants, bees, termites, fish, or man, Thomas too underscores the essential co-operativeness of living things: "We do not have solitary beings. Every creature is, in some sense, connected to and dependent on the rest." (Francis of Assissi, you were right!) He is not here using a poetic metaphor. In fact, he insists, "Inflammation and immunology must be powerfully designed to keep us apart; (else) we might have developed as a kind of flowing syncytium over the earth . . ." (a mass of protoplasm with many nuclei but no clear cell boundaries).

Thomas traces out a consistent pattern of higher organization in each group (macrocosm) of cooperative, mutually supportive entities—in cells, in hives, in termite nests, which pattern seems beyond the ken of the functioning individual units, and in which may be found harmony, structure, design, purpose. The resultant superorganism, he notes, is an entity whose function is greater than that of any of its parts.

Man may not see himself customarily in the same light, [Does man truly "see" at all?] but Thomas suggests that he should: "Perhaps . . . we are linked in circuits for the storage, processing, and retrieval of information, since this appears to be the most basic and universal of all human enterprises."

The development of human language is exactly parallel to the construction of the hill by a colony of a million ants. "It (language) is the most compulsively collective, genetically programmed, species-specific, and autonomic of all the things we do, and we are infallible at it. It comes naturally." Moreover . . . "we still have no notion how it is done, nor what it will be like when it is finished. . . ."

While final end may be in doubt (the super-organism) Thomas leaves no uncertainty about the importance of language: ". . . everything else that we recognize as human behavior derives from the central mechanism of language. . . ." "It begins to look, more and more disturbingly, as if the gift of language is the single human trait that . . . set(s) us apart from all the rest

of life. Language is like . . . hive-making (for insects), the universal and biologically specific activity of human beings. . . . We cannot b human without it. . . ."

Thomas states his view that language "is instinctive behavior. . . ." ". . . we spend our time sending messages to each other, talking and trying to listen at the same time, exchanging information. This seems to be our most urgent biological function; it is what we do with our lives. . . ."

Discussing the speculative character of the (postulated) super-organism, Thomas says, "Joined together, the great mass of human minds around the earth seem to behave like a coherent living system." "We are becoming a grid, a circuitry around the earth . . . capable of fusing all the thoughts of the world into a syncytium." (sin-si′-shəm)

With Eiseley, Thomas holds to the principle of individuality in the unity of life: "Everyone is one in 3 billion at the moment . . . a self-contained free-standing individual, labeled by specific protein configurations . . . whorls of fingertip skin . . ." These functioning human units with their individual brains, ". . . so complex and intricate . . . so powerful . . ." at present may be *at the beginning* of the evolution of the human species, Thomas suggests, ". . . just learning to use the system . . ." which will later emerge as "metazoans of thought . . ." He bids us mark the mutants, "the real surprises . . . (who) have slightly different receptors for the information . . . and slightly different machinery for processing it, so that what (results) is novel. . . . Bach . . ." for example.

Eiseley and Thomas leave no doubt as to the central place of man in the physical universe, and the importance of language, the vehicle for the expression of thought and for communication. Kinget deals with Man as a psychological unity, a person, a self, the identity of the physical organism which is independent of its constituent parts, that which is transcendent.

Eiseley's poetry is in his epic, lyrical, sometimes rapturous prose: ". . . dead matter (is) but one mask of many worn by the Great Face behind;" his prose is marked by a wise humor reminiscent of the Indians, framed in sorrows, perhaps, more solitary than social. Thomas's humor is gleeful, witty, and expert in word play: "I did not mind it when I first learned of my descent from lower forms of life. . . . But . . . I had never bargained on descent from single cells without nuclei."

Kinget's lyricism is in her meticulous and brilliant use of language, constructed like a cathedral on a great plan, architechtonically, to communicate massive solidity, elegant style and great delicacy all at once. Her humor is

216

personal, witty, always dry and incisive, sometimes broad, and reflects her experience as a psychotherapist of men and as a clinical psychologist whose brief is that of humanism, not of the "human potential movements," but of scientific humanism.

Her text considers the distinctively *human* qualities of human beings, *Homo sapiens* no longer, now technically classified as "*Homo symbolicus:* the animal capable of evolving and handling symbols and complex systems of symbols . . . ," who is characterized by his *symbolic nature,* and who "not only measures . . . time . . . but creates it . . ."

". . . the invention of abstract symbols [the alphabet] is incomparably more significant and more basic to the cultural process than the wheel, or any other," Kinget begins. By means of letters and numerals, ". . . man transcend(s) the realm of the tangible, to engage in intellectual adventures independent of the factual data of sensory evidence."

Eiseley and Thomas have prepared the reader well to accept Kinget's discussion of the symbolic or representational character of man's thinking, with the inescapable conclusion that "we know things not as *they* are but as *we* are." ". . . experience is an interpretation rather than a representation of reality . . ."*** By means of his symbolic nature, man is capable of "reflective awareness and conceptual thought," and so has become "independent of the stimulus-boundness that characterizes animal thinking."

However, in the order of nature, and of evolution, perceptual thought must precede conceptual thought. Some area of sensory contact must be functional for conceptual thought to occur, that process of representation, of abstraction, by which man constructs his idea of reality. The greatest of these constructs is his self: "A symbolic structure of attributes, capacities, values, purposes, assumptions, illusions . . . pertinent to the 'I' or 'me' . . ." and it reflects the "unique ability of man to experience himself as both subject and object," through the "process that underlies both perceptual and conceptual thought—consciousness," for which the brain is the necessary condition, though not the cause.

With Eiseley and Thomas, Kinget pauses to allude to the super-organic thrust of conscious thought, quoting Julian Huxley: ". . . the universe is becoming conscious of itself . . . cosmic self-awareness is being realized . . . in a few of us human beings."

***If he remains doubtful of the "deception" of his senses, the reader is advised to read recent works on the physical structure of the atoms.

(All three writers continually lead the reader to thoughts of the Jesuit paleontologist and mystic, Teilhard de Chardin, whom Dr. Kinget refers to specifically in several places.)

Kinget stresses that ". . . the soil and criterion for all knowledge is *living experience*—not primarily reason," but life itself. "Only experience . . . empirical, affective, intuitive, preconscious as well as conscious and rational—mediates valid cognition. . . ." To live is to know.

On the loom of his experience, man weaves the construct of time; it is a human invention for which there is no corresponding sense organ (. . . "time is not a sensory datum . . .") and perhaps, no corresponding external reality. ". . . we do not exist in time, time exists in us."

Eiseley speaks very personally of the subjective character of time in his chapter, "The Flow of the River," and again in "The Bird and the Machine." His considerations are grounded in the perspective of geological and evolutionary time, and are so haunted by the past that the future is for him perhaps only a continuation of the past. Kinget points to the future (which, be advised, exists only in the mind of Man) "as the dominant experiential dimension of the fully functioning person . . . [coming out of] the capacity to think in terms of possibilities, of alternatives for action . . . and a desire for growth that necessitate future-oriented thought and action."

With old insight and new economy, Kinget startles the reader: "Habitual standards and values tend to break down when future falls away."

[Has the man of the 21st Century given up on the future? If this is so, and the evidence for it is oppressive in its weight, has man set himself against the life-force, that dynamic, impersonal, non-judging forward-striving-tendency of nature of which Eiseley and Thomas speak with such quiet conviction? Is this in part the consequence of an overload of (compulsively) circulated "information" which is beyond man's present psycho-bioneurological capacity to process?]

But man has the power to "restructure his world endlessly" (to reshape Eiseley's "dream-world" and therefore, himself). "Man . . . is not (the) passive sum of events." He has the power to change the past by re-structuring its symbolic representation in his (present) consciousness. That is, at whatever point in existence (time) he finds himself, man has the capacity to change himself—if not radically, then enough. Men "can repeat and symbolically reformulate their personalities." "Psycho-therapeutic liberation is accomplished . . . by altering the symbolic structure of the patient's past *and the power* which *that structure exerts on him*." (Emphasis added.)

But if man's qualitative distinctiveness as a primate is in his symbolic nature, manifested in language which (as Thomas notes) seems to serve a biological imperative, the urge to communicate, this is only the beginning: "Human linguistic ability . . ." Kinget says, is a means to an end and "ranges far beyond survival-oriented communication to the highest reaches of disinterested abstraction." "Human language . . . is propositional in character and syntactical in structure . . . seldom aimed directly at survival," serving "mainly to express matters concerning the self rather than the organism . . . to (serve) the expression of ideas, things, events, and situations, or relations among these."

Kinget's consideration of specifically human behavior includes tool-making and law-making, play, love, and beauty, freedom, responsibility, death, the religious experience, transcendence, and the good life; matters, which if they are compelling in a consideration of man, are not relevant here. Her book *is* relevant and should be in the permanent library of every thoughtful person.

Three books, one in philosophy, in orientation to life and to man, realistic, sanguine, intuitive, having marked value in and of themselves. What of their value to the professional concerned with the language-disabled (man-) child? Inestimable:

1. The capacity to deal effectively with symbolic language is not relevant merely to the citizen of a print-culture; it is relevant to the member of the species, *sui generis*. To be less than competent in the management of symbolic language is to be less fully human.

2. Man's effectiveness as man, his life in the world, is dependent to a very great degree on his effectiveness with language. Most important, if he is less than adequate in the use of language, he is less than competent to construct his Self; he is vulnerable to damage in his most intimate part—his mind.

3. The experience of the particular is the vital determinant of the construction of reality, of "knowledge." The abstraction is the product, not the promoter, of cognition. The *process* is pre-eminent.

4. The product of the combined effort of child and teacher is greater than the sum of its parts. The process, shared information, "bits" and pieces of seemingly inarticulate work can lead to results which are far greater than one might anticipate.

5. In the process of re-construction of reality, re-formulation of symbols, there can emerge a new Self for the child, confident, competent, optimis-

tic, free to make use of the biologically determined urge to "think our way along, pass information around, exchange codes disguised as art, change our minds, transform ourselves" (Lewis). Such a child partakes of the dynamic thrust of the life-force. He is not shunted into a stagnant back-water of life, a back-seater in the evolutionary drama, gasping for breath. He lives. He is.

READING, PERCEPTION, AND LANGUAGE

The Orton Society-sponsored book, *Reading, Perception, and Language: Papers from the World Congress on Dyslexia,* edited by Drake D. Duane and Margaret B. Rawson, is still available in both paper-bound and cloth-bound editions.

Choice, a leading periodical for professional librarians, cites this book as a "very good collection of papers" that "could be read profitably by almost any student of language." First published in 1974, it is being used at several universities in graduate courses in language disabilities, psychology, child psychiatry, and related fields.

The paperback edition, published by The Orton Society, is available to members for $5.56 if ordered (prepaid) through the Society. (The list price at bookstores or from the distributor, The Williams and Wilkins Co., is $7.95.)

The cloth edition, published by York Press in Baltimore, is available to members of The Orton Society for $10.00 (prepaid) if ordered through the Society's office. (The list price at bookstores or from the publisher is $12.50.)

250

CUMULATIVE INDEX
TO THE BULLETIN OF THE ORTON SOCIETY
Supplement, Volumes XXVI and XXVII (1976, 1977)

Adolescents, minority. *See* Tarnopol, Lester
Adults, Dyslexics as, by Margaret B. Rawson, XXVII: 193–197
Advantages of being dyslexic, by Richard L. Masland, XXVI: 10–18
Award presented by the N. Y. branch of the Orton Society, 1975, XXVI: 7–9

Bain, A. M., Written expression—The last skill acquired, XXVI: 79–95
Bakker, Dirk J., and Raymond Van Rijinsoever, Language proficiency and lateral position in the classroom, XXVII: 37–53
Breed, J. Scott. *See* Tarnopol, Lester

Caplan, Paula J., Helping parents help their children, XXVI: 108–123
Cerebral dominance. *See* McKeever, Walter
Children, Helping parents help their, by Paula J. Caplan, XXVI: 108–123
Children, Learning disabilities in German, by Edith Klasen, XXVII: 112–126
Children, Living with, in home and classroom, by The Editors, XXVI: 107
Children with learning disabilities, Structural arithmetic and. *See* Stern, Margaret B.
Classroom, Lateral position in. *See* Bakker, Dirk J.
Community college. *See* Czerniejewski, Carol
Czerniejewski, Carol, and Mary-Alice Herbert, Language and learning therapy in a community college, XXVI: 96–107

de Hirsch, Katrina, Interactions between educational therapist and child, XXVII: 88–101
Dyslexics as adults: The possibilities and the challenge, by Margaret B. Rawson, XXVII: 193–197
Dyslexic, Advantages of being, by Richard L. Masland, XXVI: 10–18
Dyslexia in English independent systems, by Marion Welchman, XXVII: 127–131
Dyslexia in the general classroom, by Mildred H. Wood, XXVI: 124–140
Dylexia, Lateralized tachistoscopic recognition, cerebral dominance, and, by Walter McKeever, XXVII: 26–36
Dyslexia as a limitation in the ability to process information, by N. C. Miles and T. R. Miles, XXVII: 72–81

Dyslexia, Study of: Two nascent trends and a neuropsychological model, by Celia Usprich, XXVI: 34–48

Educational therapist. *See* de Hirsch, Katrina
Epstein, Abraham Gerson, Tests for assessment of language development, XXVII: 54–71

Hall, Eleanor Thurston, Small group instruction for language skills improvement, XXVI: 63–78
Heller, Tucky P., Project succeed: A volunteer system in action, XXVII: 183–186
Helping parents help their children, by Paula J. Caplan, XXVI: 108–123
Herbert, Mary-Alice, and Carol Czerniejewski, Language and learning therapy in a community college, XXVI: 96–107

Interactions between educational therapist and child, by Katrina de Hirsch, XXVII: 88–101

Klasen, Edith, Learning disabilities in German children, XXVII: 112–126
Kline, Carl L., Orton-Gillingham methodology: Where have all of the researchers gone? XXVII: 82–87

Language development, Tests for assessment of, by Abraham Gerson Epstein, XXVII: 54–71
Language and learning therapy in a community college, by Mary-Alice Herbert and Carol Czerniejewski, XXVI: 96–107
Language, The lens of, Genevieve G. Oliphant, XXVI: 49–62
Language proficiency and lateral position in the classroom, by Dirk J. Bakker, and Raymond Van Rijinsoever, XXVII: 37–53
Language skills improvement, Small group instruction for, by Eleanor Thurston Hall, XXVI: 63–78
Lateralized tachistoscopic recognition, cerebral dominance, and dyslexia, by Walter F. McKeever, XXVII: 26–36
Learning disabilities in German children, by Edith Klasen, XXVII: 112–126
Learning disabilities in minority adolescer. s, by Lester Tarnopol, J. Scott Breed, Muriel Tarnopol, and Michael Ozaki, XXVII: 132–148
Learning disabilities, Specific, by Zdeněk Matějček, XXVII: 7–25
Learning disabilities and structural arithmetic. *See* Stern, Margaret B.
Lens of language, The, by Genevieve G. Oliphant, XXVI: 49–62

Masland, Mary Wooton, Receives N. Y. State Orton 1976 Award, XXVI: 7–9
Masland, Richard L., Advantages of being dyslexic, XXVI: 10–18
Masland, Richard L., Remarks on presentation of the Samuel T. Orton Award for 1975 to Richard L. Masland made by Margaret B. Rawson, XXVI: 2–6
Matějček, Zdeněk, Specific learning disabilities, XXVII: 7–25
McClelland, Jane, The shadow and substance of specific language disability, XXVII: 187–192
McKeever, Walter, F., Laterlized tachistoscopic recognition, cerebral dominance, and dyslexia, XXVII: 26–36
Miles, N. C., and T. R. Miles, Dyslexia as a limitation in the ability to process information, XXVII: 72–81
Miles, T. R. *See* Miles, N. C.
Minority adolescents and learning disabilities. *See* Tarnopol, Lester.

Neuropsychological aspects of reading and writing, by Cecelia Pollack, XXVI: 19–33
Neuropsychological model of dyslexia. *See* Usprich, Celia
New York State Branch of The Orton Society: 1976 Award to Mary Wooton Masland, XXVI: 7–9

Oliphant, Genevieve G., The lens of Language, XXVI: 49–62
Orton-Gillingham methodology: Where have all of the researchers gone? by Carl L. Kline, XXVII: 82–87
Orton, June Lyday, 1898–1977 (*obituary*), XXVII: 198–203
Ozaki, Michael. *See* Tarnopol, Lester

Parents help their children, Helping, by Paul J. Caplan, XXVI: 108–123
Pollack, Cecelia, Neuropsychological aspects of reading and writing, XXVI: 19–33
Project succeed: A volunteer system in action, by Tucky P. Heller, XXVII: 183–186

Rawson, Margaret B., Dyslexics as adults: The possibilities and the challenge, XXVII: 193–197
Rawson, Margaret B., Presentation of the Samuel T. Orton Award for 1975 to Richard L. Masland, XXVI: 2–6
Rawson, Margaret B., Presentation of the N. Y. State Orton 1976 Award to Mary Wooton Masland, XXVI: 7–9
Reading, Neuropsychological aspects of. *See* Pollack, Cecelia.

Reading problems worldwide, by Muriel Tarnopol, XXVII: 102–111
Researchers. *See* Kline, Carl L.
Reviews of 1976, XXVI: 141–148
Reviews of 1977, XXVII: 204–234

Samuel T. Orton Awards:
1975–To Richard L. Masland, Presentation by Margaret B. Rawson, XXVI: 2–6
1976–To Roger E. Saunders, Presentation by Betty Wells, XXVII: 1–6
Saunders, Roger E. Remarks on presentation of the Samuel T. Orton Award to Roger E. Saunders made by Betty Wells, XXVII: 1–3
Saunders, Roger E., Response to presentation of Samuel T. Orton Award, XXVII: 3–6
Shadow and substance of specific language disability, The, by Jane McClelland, XXVII: 187–192
Small group instruction for language skills improvement, by Eleanor Thurston Hall, XXVI: 63–78
Smelt, Elsie D., Teaching "The language as it is," XXVII: 149–170
Specific language disability, The shadow and substance of, by Jane McClelland, XXVII: 187–192
Specific learning disabilities, by Zdeněk Matějček, XXVII: 7–25
Stern, Margaret B., Structural arithmetic and children with learning disabilities, XXVII: 171–182
Structural arithmetic and children with learning disabilities, by Margaret B. Stern, XXVII: 171–182
Study of dyslexia: Two nascent trends and a neuropsychological model, by Celia Usprich, XXVI: 34–48

Tarnopol, Lester, J. Scott Breed, Muriel Tarnopol, and Michael Ozaki, Learning disabilities in minority adolescents, XXVII: 132–148
Tarnopol, Muriel, Reading problems worldwide, XXVII: 102–111. *See also* Tarnopol, Lester
Teaching "The language as it is," by Elsie D. Smelt, XXVII: 149–170
Tests for assessment of language development, by Abraham Gerson Epstein, XXVII: 54–71

Usprich, Celia, Study of dyslexia: Two nascent trends and a neuropsychological model, XXVI: 34–48

Van Rijinsoever, Raymond. *See* Bakker, Dirk J.
Volunteer system. *See* Heller, Tucky P.

Welchman, Marion, Dyslexia in English independent systems, XXVII: 127–131
Wells, Betty, Presentation of the Samuel T. Orton Award to Roger E. Saunders, XXVII: 1–3
Wood, Mildred H., Dyslexia in the general classroom, XXVI: 124–140
Writing, Neuropsychological aspects of. *See* Pollack, Cecelia
Written expression—The last skill acquired, by A. M. Bain, XXVI: 79–95